AMERICAN
JOURNAL OF SURGERY

VOL. XXIV. JANUARY, 1910. No. 1.

FRACTURES.*

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Whether viewed simply from the standpoint of etiology and the mechanics thereof, or studied with reference to symptomatology and treatment, or considered merely in relation to complications and end results, the subject of fractures has ever been, and will ever continue to be of great interest to all practitioners of medicine, except perhaps to those engaged in certain specialties in which fractures are never met.

Involved in the consideration of the mechanics of fracture are the questions of direct or indirect violence; the effects of strain on solid bodies of irregular form and of varying density and elasticity in different parts; the lever arrangement of the movable bones, and how this arrangement affects the result of a strain applied at one point; the resiliency, tensile strength, and mobility of the parts subjected to the strain; and the amount, direction, duration of action and point of contact of the distorting force.

A due appreciation of all the several factors involved is necessary not only to a thorough understanding of the mechanics of fracture, also to the comprehension of the causes of deformity and the principles by which this may be prevented or overcome.

But even a cursory examination of the factors above mentioned would lead us too far into the domain of physics, and I shall devote my attention here to certain points concerning the symptomatology of fractures, their treatment, and end results.

Abnormal mobility, when present and recognized as such, is characteristic of a fracture, but in depressed, impacted and incomplete fractures it is generally absent; and in many cases of fracture in the neighborhood of joints it is impossible to determine definitely whether the motion felt is at the site of a fracture or in the closely neighboring joint.

Bony crepitation can be felt only in the presence of abnormal mobility; and when present it is also characteristic of fracture. But in addition to being absent where abnormal mobility is absent, bony crepitus is also absent when separation of the fragments from any cause prevents the roughened ends from rubbing together; and crepitus greatly resembling bony crepitus is sometimes found in chronic inflammatory conditions of joints and sometimes after effusion of blood at the site of fracture. So in and of itself bony crepitus is rather an evidence that the roughened broken ends are more or less in contact, than a proof of the presence of fracture.

The one variety of fracture in which crepitation is of special value is that variety in which the fracture is so close to a joint, that the presence or absence of a false point of motion cannot be determined by direct manipulation. In such cases, if true bony crepitus can be elicited, there must be a false point of motion and a fracture is certainly present. But in many of these cases, the presence of old adhesions or of effused blood, makes the determination of bony crepitus difficult or even impossible.

Hitherto, too much emphasis has been laid by many writers and practitioners on abnormal mobility and crepitation as symptoms of fracture. For while their presence makes fracture certain, their absence by no means excludes it, nor even renders it improbable. And it is precisely in those cases in which abnormal mobility and crepitation are absent that the diagnosis is often difficult, and other symptoms become of paramount importance. To certain of these symptoms I desire especially to call attention.

Deformity is often one of the most important signs of fracture. But deformity may exist without fracture, and fracture may exist without deformity. So the importance of this symptom depends upon concomitant circumstances. Deformity, that is, a deviation from the normal in the contour of a part may be congenital or developmental, idiopathic, symptomatic or traumatic; and any two or more of these factors may be associated in the development

* Read before the Brooklyn Hospital Alumni Club, June 1, 1909.

of the deformity. This may be limited to the bone, or to the soft parts, or all the tissues may be involved. It may be due to swelling in the soft tissues after recent injury, or the results of old inflammatory conditions or of old injuries. It may be due to distortion in the contour of a bone, or to a disturbance of the relationship of contiguous bones, *i. e.*, dislocations, or to the formation of new bone. Hence, in order to be considered a sign of fracture, a deformity must originate as the result of an injury, it must develop at the time of injury or shortly thereafter, and it must occur in the course of the bone itself. If it develops some time after injury, some other symptom of fracture must be sought, as it is possible for an abscess or tumor of the bone to develop shortly after and as a result of an injury.

As a rule, deformity following fracture originates at the time of injury and persists or not according to the skill and success of treatment. But in many cases of impacted and partial fractures, the deformity gradually develops or increases, following the softening of the bone, which always occurs incident to the repair; and in such cases the deformity may not become prominent until several weeks after the injury. This is the explanation of the late appearance of deformity in many of the untreated greenstick fractures of children; and of the increase in deformity which occurs after resumption of walking in some cases of fracture at the neck of the femur. Sometimes the deformity first appears or reappears when the use of the part is resumed before the bone becomes sufficiently solidified to withstand the strain of service.

Callus formation always gives rise to deformity, which may be so slight as to be unnoticeable, or so marked as to cause serious interference with function or cosmetic loss. Callus usually becomes most marked several weeks after complete solidification of the bone occurs, and then gradually diminishes during the next few months. But if marked, traces may remain indefinitely. In old cases, the localized thickening of the bone may be the only sign remaining of a former fracture.

In the neighborhood of joints, a deformity due to dislocation may greatly resemble that due to fracture; and care must be observed in deciding whether such a deformity is due to a disturbance of the normal relations of one bone to another, or is due to a disturbance of the normal relations of the constituent parts of the bone itself. In order to determine the presence or character of a deformity a careful comparison of the corresponding portions of the body should always be made; for slighter grades of deformity are often overlooked, or their character misjudged, through failure to compare homologous parts. In such comparisons, mensuration is often a valuable or even invaluable aid.

In estimating the character and degree of a deformity, it must never be forgotten that bones are solid bodies occupying three dimensions in space. Corresponding to these three dimensions, deformity may be in the long axis, as lengthening, shortening, angular deviation or rotary displacement; or it may be in one of the transverse axes, as lateral displacement, or displacement forward or backward. In the flat bones of the skull the deformity may be simply an elevation or depression of a fragment or fragments. As a rule, a deformity is the resultant of several varieties of displacement, but frequently one of these occurs alone, or is left after the bone is "set." Hence the greatest of care should be exercised in noting the exact character of the deformity, and in taking appropriate measures to reduce it, and to hold the parts in their normal position until union takes place. Sometimes this is easy of accomplishment, and sometimes it is impossible. But an exact reposition of the fragments in their normal relationships is the goal for which we must strive, and the more nearly this is accomplished the better the functional and cosmetic results. Especially in fractures involving joints, slight deviation from the normal may materially interfere with function; and in parts exposed to view, slight deformity may involve serious cosmetic loss. After reduction and splinting, the *x*-ray is often an invaluable aid in showing whether the desired reposition of the fragments has been accomplished.

Pain is usually present in fracture; but it is only pathognomonic when caused or increased by motion or manipulation, and when associated with other symptoms of fracture. When a false point of motion is present, pain is usually very severe. But when abnormal mobility is absent, pain is frequently very moderate or even absent. If absent, it can usually be elicited by a sudden jar or pressure along the course of the bone at a distance from the supposed site of fracture. If this symptom is absent fracture can usually be excluded; but not always, for the sign often fails in partial fractures. In these cases, manipulation which tends to separate the adjacent fragments causes pain. Likewise contraction of certain muscles or groups of muscles may cause pain, as for example, contraction of the flexor muscles of the forearm causes pain if the internal condyle is broken off; pronation and supination of the forearm is apt to cause pain in greenstick fracture of the radius especially if done

against resistance. The attempt to raise the leg off the bed causes pain in fracture of the femur or tibia, etc. This method of eliciting pain is of great value in determining the fracture of prominent tubercles to which strong muscles are attached; and the pain, disability and tenderness on pressure may be the symptoms on which we have to rely in making a diagnosis of this variety of fracture.

In fractures of the skull pain is not usually a prominent symptom, except in fractures of the inferior maxilla, in which cases the slightest movement of the jaw causes severe pain at the point of fracture. In fracture of the vertebrae, pain may be absent owing to damage to the spinal cord, or it may be a burning pain owing to the cord lesion. When due to fracture of the bone itself, the pain is usually called forth by jars or slight motion in the spine, and is often referred to the area of distribution of a neighboring spinal nerve. In fracture of the pelvis, pain may or may not be a marked symptom. It can usually be elicited by compression of the pelvis from side to side, or by pressure exerted in opposite directions at different points of the pelvic girdle. In the case of all these fractures, the associated lesions are often so severe, that pain may be absent, owing to shock or unconsciousness, or it may be generalized, owing to widespread contusions, or multiple injuries; so that in this class of cases, pain in and of itself is often of no great value in diagnosis, though it may give valuable confirmatory evidence.

In fracture of the ribs, pain on deep breathing, pain when the chest is compressed by the hands, either from before backward, or laterally, and tenderness at the point of fracture are usually the only symptoms to be elicited. Crepitation, abnormal mobility or deformity can rarely be noted unless several ribs are broken, or one of the floating ribs is broken, or one rib is broken in several places.

In fracture of a bone in an extremity, when pain is not elicited by ordinary manipulation of the part, it can usually be caused by a sudden blow on the end of the limb. But this rule does not apply to fractures so located that they are not subject to strain as the result of the blow. This is especially true in fractures involving the separation of prominent tubercles, in some of the partial fractures of the shaft or head, and sometimes in fracture of the fibula, especially the lower end. Lack of pain at the hip after a blow on the foot is often noticed in impacted fracture of the neck of the femur; and in such cases absence of pain must be taken to exclude fracture. In certain pathological conditions, especially nerve lesions, the sense of pain may be lost, and hence no pain is felt after fracture.

Tenderness, that is, pain on pressure, is often a very valuable sign of fracture; and at times it may be the only significant sign of fracture preserved. To appreciate its significance certain points must be considered. As a rule, tenderness has no great value as a diagnostic sign in case of direct injury. For in such cases, the damage to the soft parts, or even bruising of the bone itself, may account for the tenderness without fracture being present. And if fracture is present, there are usually sufficient other symptoms as evidence thereof, to render tenderness of no especial diagnostic value. However, even in cases of direct violence with more or less contusion or laceration of the soft parts, the presence of localized tenderness at one portion of a bone may prove a valuable confirmatory symptom if crepitus and abnormal mobility cannot be determined. This is especially true if the tenderness extends in a more or less irregular line along or across the bone, and if it is located on both sides of the bone, or on the side opposite to that directly beneath the contused area. But in this connection it must be recollected that both sides of a part may be contused or lacerated without fracture of the bone, by being caught between two opposing surfaces; as for example, a limb run over by a wheel, may be markedly contused or lacerated on both sides or around the entire circumference, without the bone being fractured.

Occasionally, the presence of inflammatory conditions may make it very difficult or even impossible to determine whether the tenderness is in the bone or in the adjacent tissues; and occasionally it is impossible to learn whether the tenderness antedates or is consequent upon the injury. Hence inflammation in the neighborhood may materially diminish or render valueless the evidence given by the presence of tenderness.

It is in cases of indirect violence that tenderness becomes characteristic of fracture even without other well marked symptoms being present; and this is particularly true of scale fractures, greenstick fractures and fissure fractures. To these I desire particularly to draw your attention in passing.

Severe so-called sprains, with marked tenderness, not over the ligament but over the point of attachment of the ligament to the bone, are in reality cases of fracture, a thin scale of osseous tissue with the ligamentous attachment being torn loose from the main body of the bone. Regarded as fractures and properly treated as such, these cases recover as do other fractures. But neglected, they are apt to cause disability lasting indefinitely. In greenstick

fractures of children there is apt to be some pain on motion or manipulation, and moderate disability. But the tenderness at one point is often the most characteristic symptom elicited. Cracks in the bone, especially in the neighborhood of joints, often develop, when the distorting force is sufficient to cause complete fracture. Their true nature is usually overlooked, and they are usually diagnosed as sprains. Such cracks may follow any of the ordinary lines of fracture, but as they fail to completely cross the bone and no fragment is broken off, the symptoms of fracture are very obscure; and beyond slight disability, there's often no other sign of fracture than the tenderness along the line of the crack and later the development of callus. Fissures in the skull may be considered as a variety of this class; but the tenderness along the fissure is usually marked by the associated lesions.

The importance of recognizing the nature of this class of injuries is three-fold: First, if neglected, further traumatism may result in complete fracture; or in the formation of exuberant callus and more or less interference with joint function if the injury is near a joint. Second, deformity may develop as a result of callus formation or as a result of osseous softening, which always occurs incident to the process of repair. Third, failure to recognize the condition, if followed by secondary complications, may discredit the physician or even involve him in a suit for malpractice.

Swelling and ecchymosis alone, without other symptom of fracture, usually indicate contusion of the soft parts, or laceration of a good sized vessel; and in the presence of direct injury with considerable contusion of the parts, they are valueless in estimating the presence or absence of fracture. Fracture often occurs in such cases and swelling and ecchymosis may be very pronounced, but in some of the most pronounced cases of swelling and ecchymosis that I have ever seen, the bone was not fractured. It is in cases of indirect violence that swelling and ecchymosis become of value in diagnosis. Swelling along the course of a bone, or involving the circumference of a limb, developing speedily after force applied to a distant portion of the bone or limb, and followed within twenty-four to seventy-two hours by ecchymosis in the region of the swelling or lower down usually indicates a fracture of the bone, and in the presence of any other symptom warrants a diagnosis of fracture. But I have seen the symptoms from subcutaneous rupture of varicose veins of the limb, and after rupture of the interosseous artery of the forearm by a ball on the hand; so that alone they are not proof of the presence of fracture.

The *x*-ray is often a valuable means of diagnosing obscure fractures, and of determining whether our efforts have been successful in reducing the fragments and holding them in place. But it must never be forgotten that the *x-ray plates are not negatives of objects, but only negatives of shadows.* Now it is a well known fact that the shape of a shadow depends not only upon the form of the object casting the shadow, but also upon the relation of the object to the surface upon which the shadow is cast, and to the light casting the shadow; and so this may fail to give any accurate conception of the actual form of the object by which the shadow is cast. Deviations from the normal contour of a bone may be magnified or minimized by slightly changing the relative positions of the light and of the object to the photographic plate. Hence the interpretation of a negative requires not only considerable experience and a knowledge of the position of the parts during exposure, but it frequently requires a knowledge of the existing conditions as revealed by a careful manual examination. So the *x*-ray plate should be used, as a rule, only to confirm or correct a diagnosis based on other methods of examination, and rarely as the primary means of making a diagnosis.

In the examination of all injured persons, one point can hardly be too often insisted upon; namely, that the presence of one injury does not exclude another. A greenstick fracture of the radius may coexist with a fracture at the elbow. And woe to the doctor if he treats one injury and deformity and loss of function results from his neglect of the other! A fractured clavicle may coexist with fractures of the bones of the arm; and a fracture of one of the carpal bones often goes with a fracture of a metacarpal bone. One tibia may be broken, and the opposite femur at the hip. All of these combinations of injuries I have seen and treated, and many more like them. And several times I have seen patients in whom serious deformities remain as a result of the doctor in charge failing to notice and treat the companion injury. It is, of course, most common for such mistakes to be made in the case of the unconscious and children. But even in conscious adults, the pain or disability from one injury may so overshadow that from another, that only one is complained of, and only one will be noticed unless the others are searched for.

Fracture having been diagnosed, the proper treatment is of the utmost consequence. Into the details of treatment of each separate variety of fracture, of course, I cannot go. That would require a book. But there are certain general principles which should always be kept in mind. First, the preven-

tion of further damage to the parts through careless handling or undue manipulation. Second, the correction of deformity, by which we understand a reposition of the fragments in their normal position. Third, the use of such mechanical supports as will continue to retain the fragments in correct position until osseous union is complete. Fourth, the avoidance of undue constriction of the parts by too tight bandaging. Fifth, the endeavor to prevent contractions and adhesions in the soft parts, by suitable manipulation and avoidance of long continued fixation in one position.

In all manipulations affecting fractures, gentleness, of course, should always be exercised; and care must be taken not to cause or allow further damage to the parts. In many cases it is necessary to transport the patient to a place where suitable treatment can be had. And in such cases a provisional splint is often indicated. In fractures of the spine, especially, the greatest of care should be taken to prevent any motion along the vertebrae; for slight movement may cause irreparable damage to the cord, if this has not already occurred at the time of the original injury.

The first point in the treatment of the fracture itself is its reduction; that is, the correction of deformity. Sometimes this is easily accomplished; sometimes it is difficult, and sometimes impossible.

Extension and counter-extension with or without lateral pressure and rotation are the manipulations most commonly indicated for the reduction of fractures, especially in fractures of long bones. But in many cases, as the patella and olecranon, relaxation of the parts is necessary to bring the fractured ends into apposition. In a large number of cases of fracture of the long bones, it is impossible to control the position of one fragment; and so it is necessary, for proper reduction, to determine the position which this fragment takes, and then place the controllable fragment in a position to correspond. In impacted fractures, with but few exceptions, the impaction must be thoroughly broken up in order to afford complete reduction. This is particularly true of the ordinary Colles' fracture at the wrist. But not in all impacted fractures should reduction be attempted. In impacted fracture of the neck of the femur in the aged, and in impacted fractures of the head of the humerus it is usually better not to attempt reduction, for if the impaction is broken up, failure of union is apt to result. However, in cases of fracture of the neck of the femur, Whitman has shown that much better results can be obtained by suitable manipulation and fixation than is usually considered possible in this variety of cases.

It is now known that bony union of the fragments does not usually begin until ten or twelve days after the occurrence of the fracture, from which fact it has been inferred by some that correction of deformity may be left to the middle of the second week. This may be true in a limited number of cases; but in the vast majority such practise would result disastrously. Particularly in cases with overriding of the fragments reduction should be attempted as soon as possible; and sufficient traction should be used at the outset to speedily accomplish the desired result. A fractured femur that could be reduced by ten pounds traction shortly after injury, might require twenty pounds a day later, and fifty at the end of the week. I have even seen it require eighty pounds to reduce overriding in a femur in a case which had been neglected for about ten days. But such excessive force is dangerous to life as well as to limb, and attention to proper reduction at the outset would have obviated any such necessity. The mistake should never be made of beginning with insufficient traction, and of then gradually increasing the amount. By such methods several times as much tractive force as was necessary at the outset, may be exerted to correct the deformity and yet reduction fail because the force was not applied sufficiently early.

An anesthetic is sometimes necessary for the correction of a deformity, but it is certainly an error to claim, as does a recent writer, that "every fracture with displacement calls for etherization." An anesthetic is totally unnecessary in the vast majority of cases with or without displacement. Where, however, a patient wishes to be spared pain, and the facilities are at hand for administering an anesthetic properly, it is often a convenience to the doctor and a comfort to the patient. In treating an anesthetized patient there is always danger of too much zeal on the part of the surgeon, and too much manipulation of parts. It must always be recollected that the mere fact that the patient does not feel any pain, does not prevent the infliction of serious damage; and the relaxation of the muscles incident to anesthesia may favor further injury, if gentleness and care are not exercised in the attempt to overcome the deformity. If reduction cannot be accomplished by a reasonable amount of manipulation, the deformity should be allowed to remain, or open operation should be decided upon.

The treatment of fractures by open operation is a topic which has produced much discussion in recent years. For a time it seemed as if the advocates of operation were gaining ground steadily;

but now a more conservative view is generally held. In a recent article, Stimson shows that the advantages claimed for an open operation are largely chimerical, and the disadvantages are weighty. In the matter of operation for simple fractures in long bones, he sums up as follows: "Applying the old criteria of promptness, safety and efficiency, it appears then that operation is less prompt in its results and less safe; and is more efficient only in a very small number of cases. It should therefore be reserved for those cases in which gross displacement exists and cannot otherwise be corrected, in which its need is clearly evident."

In the case of the short and irregular bones matters are somewhat different. Suture is rarely indicated except in fracture of the patella; but the removal of a fragment or even of the entire bone, may be followed by better functional use, than results from more conservative treatment. Where a fragment of bone interferes with the action of a joint, and cannot be dislodged by manipulation, operation for its removal is clearly indicated, if the state of the patient warrants an operation. In suturing the patella care must be taken to stitch the periosteum and adjoining ligamentous tissue.

In compound fractures a wound already exists, and it may be necessary to remove separated fragments or badly contaminated projecting ends. But when it comes to the question of suturing the fragments, and how this should be done, there is considerable difference of opinion. To place a suture involves considerable manipulation and increased traumatism to the damaged parts. Suppuration is very liable to occur; and the presence of a foreign body in the bone favors infection and tends to delay union. Furthermore, the suture itself will only hold the ends in fair apposition; it cannot be relied on to maintain perfect alignment. This must be accomplished by splints, whether suture is used or not. Hence in the majority of cases suture is contraindicated and should be omitted. When sutures are used, medium sized chromic gut is the best suture material. It is generally absorbed, and no foreign body is left in the wound to prolong suppuration indefinitely if infection does occur. The wound itself should be treated as any wound which is presumably or actually infected; and the splint should be so arranged as to give access to the wound without disturbing the fragments.

The indications for operation in fractures of the skull, vertebrae and pelvis depend largely on the associated cerebro-spinal and visceral lesions, and need not detain us here.

In the treatment of practically all varieties of fracture, except those of the skull, some form of mechanical support or retention apparatus is usually necessary. This support may be afforded simply by a few turns of a bandage, or what is usually better, the application of zinc oxide adhesive strips; but more usually some form of splint is necessary. In fractures of the lower extremity, fracture boxes and sand bags in combination with extension and counter-extension often take the place of splints during the first few weeks of treatment. In the selection of splints, there is much latitude for choice. Molded hard rubber and metal galvanized wire netting, moldable leather and pasteboard, flexible and inflexible wood, and plaster of Paris splints, all have their advocates, and suitably selected for a particular case, each may give satisfactory service. The lack of unanimity of opinion as to which is the best splint for any particular fracture probably proves that there is no "best," but that the "best" is largely determined by the environment of the patient and by the physician's experience and preference. What is "best" in the hands of one man may prove worthless in the hands of another, and what one considers inefficient may be extolled by another. But while the materials of our splints may differ, and the method of their application may be a matter of dispute, there is agreement on one essential point; namely, that the splints should retain the fragments in their proper relations until union takes place.

For most fractures where splints are required, I prefer plaster of Paris splints, molded to fit the part and applied directly to the previously anointed skin. Plaster of Paris bandages are cheap, readily obtained, easily carried, and easily applied. The splint is quickly made by molding the layers of moistened bandage directly to the skin; or, what is usually better, a sufficient number of layers of the moistened plaster bandage is arranged as a flat pad large enough to cover the portion desired, and then this soft pliable pad is molded directly to the skin, and held in place by a few turns of gauze bandage. With good plaster, hardening takes place in a few minutes and the molded splint is made. In the case of the extremities, we usually make two pads, each encircling about one half the limb, and they are applied anteriorly and posteriorly or bilaterally as best suits the configuration of the part. After the plaster sets the splints can be removed and the edges trimmed smooth if necessary. During succeeding days, first one and then the other splint can be removed and the parts massaged without danger of disturbing the fragments.

In cases of fracture at the elbow joint, where fre-

quent change in the position of the bones entering the joint is especially desirable, I prefer galvanized iron wire netting, bordered with adhesive plaster and properly padded. This makes a light and efficient splint and one which can be bent from time to time to fit any desired position of the joint. In cases of compound fracture, it is necessary to so arrange the dressings that the wound can be treated independently and without disturbing the splints. For this purpose a plaster cast usually makes the best splint. It is applied above and below the site of fracture, and a sufficiently large window left open or cut out afterward to dress the wound. The window thus made frequently leaves the cast too weak at one point; and in order to give sufficient rigidity to hold the fracture properly, it is usually necessary to reinforce the cast by two to four iron bands incorporated therein, and looping over the dressings about the wound.

When there is a tendency to overriding, continuous traction is desirable, and in many cases is indispensable to correct or prevent deformity. Much ingenuity may be expended in ordering it to the best advantage; and it must be so applied as not to exert undue tension on an intervening joint. Three principal methods are in common use. First, the application of weights. These may be attached directly to the limb, or indirectly by rope and pulley. The former is especially adapted to fractures of the humerus, and should be used far more frequently than is the custom; the latter is especially adapted to fractures of the femur and tibia, and is commonly employed. The use of the inclined plane for supracondyler fracture of the femur, may be considered as a variety of this method, the weight being supplied by the pelvis and thigh of the affected side. Second, the use of some form of splint which prevents overriding. The fragments are held in their normal relationship by manual force, or by windlass and pulley and the splint so applied to the limb that shortening of the affected bone is impossible. To obtain the proper purchase it is commonly necessary to include in the splint the joint above and below the site of injury. Third, some form of more or less elastic traction apparatus applied to the limb directly above and below the site of fracture. For fracture of several metacarpal bones or of the phalanges, this method often proves serviceable; the traction being supplied by rubber bands attached at one end to the skin by adhesive bands and at the other to an inflexible board splint projecting beyond the hand. This same idea has been applied with success to fractures of the shaft of the bones of the extremities, the contraction of the muscles being opposed by an inflexible board splint somewhat larger than the bone, from each end of which adhesive strips pass to the limb just above and below the break. These strips are applied sufficiently taut to prevent any overriding, and additional encircling bands are used as necessary to hold the splint in place.

Whatever the nature of the splint chosen, care must always be taken to see that it is applied tight enough but never too tight. The complaints of a patient that the splint is uncomfortable or that it hurts should never be disregarded, even if it is necessary to remove the splint. Anodynes should be given only to meet special indications and never because the splint is uncomfortable. The failure to observe this precaution may result in pressure necrosis, or even in ischemic paralysis. During the first few hours after the application of a splint, the extremities should always be watched to see that there is no interference with the circulation. Coldness or numbness or pain is an indication that the splints are too tightly applied, and that they should be at once loosened or removed. It is always well in any case that the splints should be removed and reapplied several times during the first ten or twelve days following a fracture. For swelling at first tends to make the splints too tight, and atrophy at last to make them too loose; and they must be changed from time to time, to adjust them to the size of the part.

It has been shown that during the period from about the tenth or twelfth to the twenty-fourth days, osseous union usually takes place. In the period before this the provisional callus is formed, and in the period succeeding the firmness of the bone is regained. During the first and third periods massage is indicated; but during the second it is contraindicated and the parts should be left undisturbed. In applying massage, gentleness must be employed and care taken not to disturb the fragments. By this method of treatment the best functional results are obtained in the least possible time. Another advantage in frequently removing the splints during the early and latter days of healing, is the opportunity thus given for comparing the outrect estimation of whether an accurate reposition has been effected, and whether the splints are holding the parts in place.

If a moderate deformity exists after bony union has taken place and before solidification has occurred, constant steady pressure may be sufficient to restore the parts to approximately normal outline. This is especially true of angular deformities in long bones, in which we have frequently been able to restore the normal contour more or less completely, by pressure, evenly distributed and applied continuously for several days. Only a few weeks since I was able to restore to practically nor-

mal outline a radius which had been fractured a couple of inches above the wrist and neglected for about three weeks. The patient was seen a day or two before he came under my care, by a well-known surgeon, who told him the bone would have to be refractured to correct the deformity. But constant pressure applied for several days reduced the deformity without a refracture. In applying pressure, care must be taken not to use sufficient force to fracture the bone, nor to cause interference with the circulation.

The fact that it takes considerable time for bones to regain their natural firmness after union in the fracture, and that they will bend without breaking under continued pressure, is often exemplified in cases where the splints are removed too soon. Two of the worst deformed femurs I have ever seen, were in patients who left the hospital with straight thighs; but the bone was too soft to endure the strain and bent under the body weight. One of these patients was under my care, but left the hospital without my knowledge or consent at least two weeks before he should have been discharged. A few weeks later he returned to the hospital with a tremendous outward bowing at the middle of the thigh. The other patient was treated in a distant hospital for fracture at the junction of the middle and lower third of the thigh. He stated that he left the hospital with a perfectly straight thigh, but that it gradually bent under him during the first few weeks following his discharge; and he applied to us for correction of a deformity, which carried his leg and knee outward and forward at an angle of more than 30°.

Such facts are probably known to all practitioners, and are sometimes made the excuse for allowing splints to remain on longer than necessary. But it is doubtful if the full significance of such cases is fully recognized, and advantage taken of this period of softness, to correct deformity which has escaped reduction up to that time. If fracture occurs at a joint, two principles have to be considered. First, place the parts in the position in which they can be retained in their normal relationship with the least difficulty. Second, place the parts in the position in which they will be most useful if ankylosis remains after union has taken place. These two positions are often diametrically opposed to each other, and it sometimes affords an opportunity for nice judgment in deciding in what position to place the parts. A fairly safe rule is this: first place the parts in the position in which the fragments are most easily kept in normal relation. Remove the splints at least a couple of times during the first ten or twelve days, massaging the parts gently, and moving the joint moderately but with care not to disturb the fragments. Allow the joint to remain practically immobile during the second ten or twelve days, and at the end of this time gradually bring the limb into the position of greatest usefulness. Then, during the succeeding days gently massage and exercise the joint in the effort to prevent ankylosis. But do not overdo passive motion in the first month after fracture; it tends to increase the formation of cal-applied with success to fractures of the shaft of the bones of the extremities, the contraction of the lus, and retards the restoration of function.

The fracture of a bone *per se,* rarely endangers life; though fat embolism, resulting from fracture, has occasionally caused death. Multiple fractures might occasion death as a result of shock; but dissociated from other injuries, this is exceedingly rare. Multiple fractures of the ribs are sometimes followed by death from interference with respiration; but death in such cases is usually caused by associated lesions of the thoracic viscera. In fracture of the skull vertebræ and pelvis, it is the cerebro-spinal or visceral lesions which determine the results, rather than the fracture itself. Compound fractures are more dangerous than simple ones from the fact that they are very liable to infection, and are often badly infected by the original trauma. Such infections tend to run a very severe and oft-times fatal course; and actively begun, even amputation may fail to prevent the lethal outcome. In the aged especially, fractures which confine the patient to bed are frequently followed by pneumonia and death. So, though as a rule, we have no fear that a fracture will prove dangerous to life, still in a fair proportion of cases the associated lesions and after-effects may cause a fatal termination, and we must guard our prognosis accordingly.

When we speak of functional results, we mean the usefulness of the part after fracture, as compared to its usefulness before fracture. This depends upon the following factors: The union of the bone and its solidification; the accuracy of alignment of the fragments; the extent of callus formation; and the associated lesions. In a small proportion of cases, union fails to occur. In some of the cases, this is caused by separation of the fragments, and can be cured by operation. But in others, no local cause can be found, and operation fails to relieve; such cases are often benefited by local and general tonic or antisyphilitic treatment. Under local treatment are included active and passive hy-

peremia, massage, etc. In fractures of the shaft of the long bones of the extremities, moderate deformity may not interfere with function. But in the neighborhood of joints even slight deformity is often followed by very serious interference with function, or even total disability of the joint. In spite of the best of care this sometimes occurs. But careful attention to detail will usually prevent this unfortunate result. The amount of callus depends largely upon the perfection of alignment, and the freedom from motion at the site of fracture. The more perfect the adjustment of the fragments, and the less the motion during the stage of uniting, the less the callus and vice versa. Not only does exuberant callus formation mechanically hinder the normal movement of joints, but it often seriously interferes with function by undue sensitiveness and by pressure on pressure on neighboring nerves, causing pain or paralysis. In some cases the nature of the fracture or the presence of complications, and in others the circumstances or character of the patient may make it impossible to obtain a satisfactory result. Hence in any case, and especially in those involving joints, or complicated by other lesions, the prognosis as to functional results should also be guarded.

The cosmetic result largely depends upon the accuracy of alignment of the fragments, and the absence of undue callus. As a general rule, the more perfect the reduction the better the cosmetic results; and likewise, the better the functional result. But in some cases a good functional result may be obtained with a poor cosmetic result, or vice versa. Generally the functional result is the more important. But in cases of fracture involving portions of the body ordinarily exposed to view, it is very desirable to obtain a good cosmetic result; for in such cases the patient may regard cosmetics as of as much importance as function. Especially is this true of Colles' fracture at the wrist, where a poor cosmetic result is frequently followed by a suit for malpractice, even though the functional result is good.

In giving a prognosis to a patient, we must always steer a middle course, neither too sanguine nor too pessimistic. We must not promise more than the case warrants, for if we do the patient will be dissatisfied by the results, no matter how skilful the treatment; and we must not promise too little lest he become despondent and seek advice elsewhere. There are always possibilities of untoward results in the simplest cases; and brilliant results are often achieved in the most unpromising cases.

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A FURTHER REPORT ON THE USE OF THE PHOTOSCOPE FOR DEMONSTRATING OPERATIONS TO A LARGE NUMBER OF VISITORS.

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In September, 1908, I briefly described in the AMERICAN JOURNAL OF SURGERY,* "An Apparatus for Providing a Large Number of Visitors with a Complete View, and for Securing Photographs and Moving Pictures of Operations." Since then I have considerably modified the apparatus, and I have had repeated opportunity to test its merits.

Figure 1 shows the crude and imperfect photoscope which I put together for experimental purposes and which I have been using at the hospital with great satisfaction. The images produced are excellent in detail, despite the fact that neither the lens nor the mirrors in this working model are as they should be and the adjustment mechanism is coarse. 1 and 1′ are ordinary spot-lights, as seen in any theater. In front of each a glass cell, through which circulates a watery solution of alum, absorbs the heat rays. The operating field, brilliantly illuminated, will remain cool over three hours without changing these cells. The mirror box (2) is brought directly over the operating field. It contains two five-inch square surface mirrors. In the finished apparatus this box will have attached to its under surface a glass shield, five feet in diameter, with a five-inch opening in its center. The first mirror reflects the image of the operating field into the second mirror which, in turn, reflects it, unrefracted, into the camera lens (3). Through the camera box (4) the image is transmitted to the ground glass screen set in the partition (6), which separates the operating room from the spectators'. At (5) is a door connecting the two chambers. The view may be shut off at any moment by a slide under the mirror box.

A universal focus lens keeps the field always in focus, and so little light and color are lost in the transmission of the image, thrown full size on the ground glass, that spectators seated even several feet behind the partition have as good a view of the operation as though they were standing by the table. Figures 2, 3 and 4 are reduced from photographs, 11 x 14 inches, which I made by replacing the ground glass screen with negatives.

* A description of the method appeared later in *The Scientific American* (March 13, 1909) and in various medical, technical and popular journals of America and Europe.

In July, 1909, through the courtesy of the trustees of The Volunteers St. Gregory's Hospital, I made the first demonstration of this apparatus to several invited colleagues. Seated outside the operating room, they saw an operation I performed projected on the screen, and they all expressed themselves as able to follow every detail with ease. On another occasion a physician who was present at a demonstration of the photoscope wrote the following concerning an appendicectomy performed by Dr. Marshall W. McDuffie:—

"From the moment the anesthesia was begun until the patient was ready to be removed to the ward, every movement of the surgeon and his assistants was plainly visible. The parts surrounding the seat of the operation were clearly and distinctly illuminated. Shading off on the edges of the field were the surgeon's body, and the outline of the anesthetist. One could witness the operation from a point directly over the wound, and we all watched with keen interest the noiseless motions of the nurses and attendants as they assembled the necessary instruments and drapery.

"All preparations having been completed, the surgeon received the scalpel from his assistant and made the first incision. In the trail of the scalpel a thin red line marked the wound. Another scalpel was taken and the subcutaneous tissues were divided. The fat and muscle tissues were clear cut and well defined. The reflection of the peritoneum was perfect.

"We saw the smaller vessels as they spouted and were successfully ligated, or brought under control, while the slight differences in the color and texture of the various tissues exposed were clearly appreciated. As the operation progressed the eye

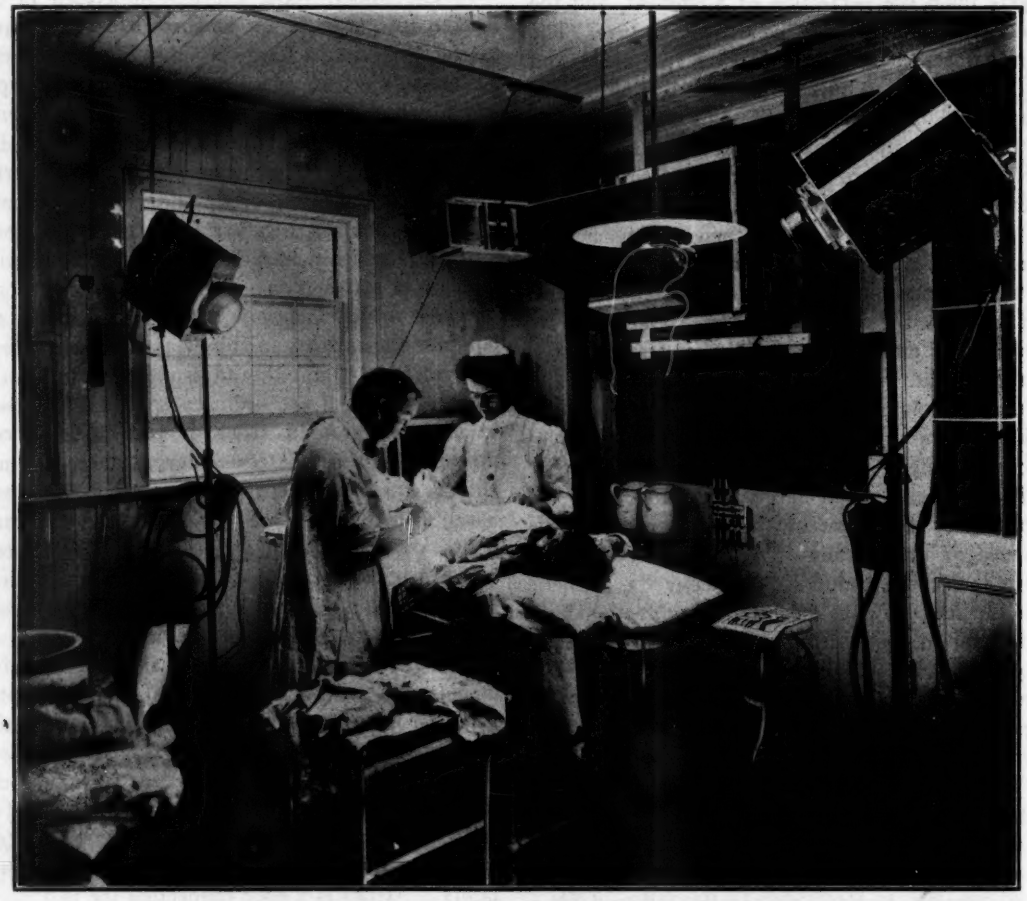

Fig. 1. Rough Model of Photoscope Set Up. *1, 1'*, Spot Lights; *2*, Mirror Box; *3*, Lens; *4*, Camera Box; *5*, Door Leading to Visitors' Room—Here a Megaphone May Be Inserted; *6*, Partition in Which Sets Ground Glass Screen.

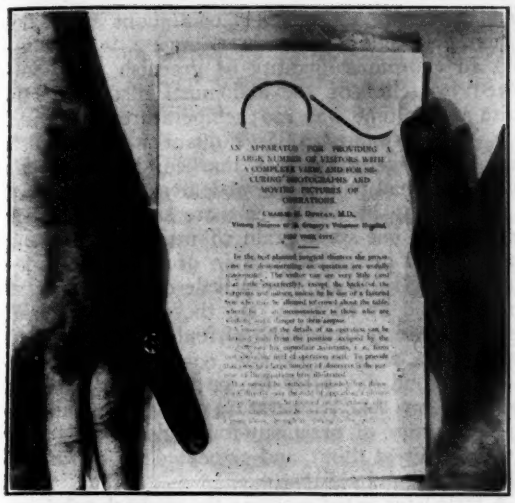

Fig. 2. Objects Posed on the Operating Table.

Fig. 4. Note the Details of the Skin, Gauze, Etc.

followed the knife and scissors with increasing interest, until the actual excision of the offending organ took place. None of the phases of the operation, not even the least important, was missed."

Briefly to repeat here the purposes and advantages of this apparatus: It affords to a large audience a clear view of all the steps of an operation. The spectators are comfortably seated in an adjoining room, where they may enjoy a well ventilated atmosphere, free from steam and the vapors of narcotics. They do not crowd upon the surgeons, distracting their attention and, perhaps, compromising their asepsis. The photoscope is admirably adapted for taking individual or cinematograph pictures of an operation. By changing the lens it may be used for enlarging, as of a specimen *in vivo*.

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Fig. 3. Compound Fracture of the Leg. About to be Amputated by Dr. Ralph Steward. Note the Clearness With Which the Blebs, Hair, Etc., Are Seen.

ACUTE DILATATION OF THE STOMACH WITH REPORT OF CASES.*

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The literature on the subject of acute dilatation of the stomach indicates that it is rather a rare condition. Two hundred and twenty-five cases constitute, according to Nicholls, the total number of recorded instances of this serious affection, in the available literature.

It is an affliction fraught with grave danger to the life of the victim, and one the early recognition of which is necessary, because the many times life saving treatment must be early to be of any avail. The mortality in the past has been between 60 and 80 per cent.

The literature has been extensively reviewed by Campbell Thomsen ("Acute Dilatation of the Stomach," William Wood & Co., 1902), by L. A. Connor in 1907 (*American Journal of the Medical Sciences*, Vol. 133, p. 345). by W. B. Laffer in 1908 (*Annals of Surgery*, Vol. 47, pages 416-532), by A. G. Nicholls in 1908 (*International Clinics*, Vol. IV, Series 18, p. 80) and others; hence I will not include such a review here.

* Read before the Omaha Medical Society, April 17, 1909.

M. Beaurain, in his Paris Thesis of December 23, 1908, entitled "L'Occlusion aiguë du duodenum par l'artère mésentérique supérieure," cites the following case:

"A woman of sixty-nine years, the subject of chronic bronchitis, and a patient in the general infirmary of Rouen for several years, was seized suddenly with alimentary vomiting. In the morning at the time of the visit, she was found slightly distended, not suffering much, was without fever, and there was no general reaction and the diagnosis of indigestion was made.

"In the afternoon vomiting reappeared, this time greenish, bilious and fecal appearing, though without a fetid odor. The abdomen was not much dilated, there was no pain, but the state of the patient appeared manifestly serious, and everything pointed to an intestinal occlusion as the cause. One hesitated to operate because of the uncertainty of the diagnosis, and the following day the patient died in collapse.

"At autopsy the stomach and duodenum were notably distended, one part more than the other. In searching for the cause of this distention, it was determined that the third portion, the part which passes between the superior mesenteric artery, near its origin, and the aorta, was compressed by the superior mesenteric artery. The latter was stretched over the duodenum like a cord, holding it back against the spinal column. It was plainly a case of strangulation of the duodenum by the superior mesenteric artery."

I selected the quotation of this case as typical in its clinical course, termination and post-mortem findings, of that class of cases of post-operative dilatation of the stomach and duodenum to which such names have from time to time been applied as arterio-mesenteric ileus, gastro-mesenteric ileus, mesenteric intestinal incarceration, post-operative ileus, post-operative acute dilatation of the stomach, acute duodeno-jejunal intestinal obstruction, post-operative gastric paralysis, duodenal ileus, etc.

The two following instances occurred in my own work:

CASE I.—Chas. C., aged 10, on June 8, 1907, at three P. M. was operated upon "during the interval" and the appendix removed, the wound being closed without drainage. Ether anesthesia was used and the operation required twenty minutes.

There was no post-anesthetic vomiting, the patient partook moderately of water, three hours after the operation he voided fourteen ounces of urine and slept fairly well during the night. At six A. M. (fifteen hours after the operation) he became quite restless and complained of vague "heavy" pains in the abdomen and immoderate thirst. The abdomen was moderately distended, though not rigid. The pulse was 120, temperature 99°, respiration 30, and the boy appeared to be in collapse.

At 10 A. M. he vomited a small amount of clear, sour fluid. He was given a continuous saline infusion, per rectum, of one liter. At 4 P. M. he vomited an enormous quantity of greenish fluid, followed by relief of the abdominal distress. His pulse at this time was 120; temperature 98.8°. At 9 P. M. he vomited a large quantity of greenish fluid, the prostration was marked, he was very thirsty and had pain in the abdomen.

At 10 P. M. he was given more salt solution per rectum and one-sixth grain of morphine and one one-hundred and fiftieth grain of atropine, hypodermatically. He slept very little during the night and vomited at 12:30 A. M., the ejected material being profuse, greenish and of foul odor. He voided urine at 4 A. M.

The second day after the operation, at 6 A. M., the pulse was 130, temperature 98.5°; he vomited a large quantity of greenish, foul fluid, complaining always of great thirst, and presented the picture of one in profound collapse.

A little later in the morning the stomach tube was passed and a liter and a half of foul, dark greenish fluid was withdrawn. The stomach was washed until the water returned clear. During the process the lower border of the stomach was demonstrated, four finger breadths above the symphysis pubis. The diagnosis by this time was clearly "actute post-operative dilatation of the stomach." No peristalsis could be made out in the stomach.

The boy was now placed on the abdomen and the foot of the bed elevated three feet. His condition immediately began to improve. His pulse in the evening was 112 and his temperature 98.6°. In this position he slept for several hours, when he awoke and vomited about 200 c.c. of clear fluid.

The following morning (the third day after the operation) the pulse was 100 and temperature 98.8°; collapse had largely disappeared, together with his annoying thirst and abdominal distention; so that he was placed upon his back, and the foot of the bed lowered, and he expressed himself as feeling quite well. He was given a high compound enema with good results. During the morning he drank a small quantity of coffee on several occasions.

In the early part of the afternoon he again suddenly became restless, the pulse increased to 140, temperature was 98°, and he vomited a large quantity of greenish, foul fluid. The stomach was again washed well until the irrigating fluid returned clear, the patient was placed upon the abdomen and the foot of the bed elevated as previously. A continuous saline infusion was given per rectum.

This procedure, as before, afforded the most phenomenal relief to the patient, and he slept for several hours in this position. This ventral decubitus was continued for twelve hours, and on again resuming the dorsal position, no return of the symptoms of gastric dilatation recurred, and the patient from thence made a smooth recovery.

This case demonstrates in a striking manner the utility of postural treatment for acute post-operative dilatation of the stomach. Note the recur-

rence of the symptoms when the sufferer was changed from the ventral to the porsal position and again their sudden disappearance when the former posture was resumed.

CASE II.—Mr. C. W., aged sixty. Operation November 6, 1908, 8 A. M. Partial resection of the stomach for carcinoma involving the lesser curvature, reducing the lumen of the stomach to about that of the colon.

The patient was returned to bed in good condition, and given one pint of physiological salt solution per rectum.

Five hours after the operation the temperature was 98.6°, pulse 90, respiration 22. He had not vomited.

In the evening he was catheterized and eight ounces of urine were withdrawn. He was also given one-sixth grain of morphine hypodermatically for the pain of which he complained at the site of the operation. He took small quantities of hot water at intervals during the day. The night was passed with broken sleep and with a fair degree of comfort.

November 7th, the first day after the operation, passed uneventfully. The patient partook sparingly of hot water, the pulse remained in the neighborhood of 100, temperature 99.5°, respiration 26.

He was catheterized twice during the day and the abdomen was not distended, although he suffered some pain at the operation site, for which in the evening he was given one-sixth grain morphine hypodermatically.

November 8th, second day after the operation, the chart indicates that he had slept fairly well during the night, with pulse 106, temperature 99° and respiration 22 at 5 A. M. He complained of some distress in the abdomen and was given a soapsuds enema which returned, followed by a liquid stool and flatus, with relief of the abdominal distress. He was allowed hot water sparingly and liquid peptonoids twice during the day.

In the evening he complained of quite severe pain in the abdomen, which was moderately distended. He was given a high enema with negative results. At 6 P. M. one-sixth grain of morphine and one one-hundredth grain of atropine were administered hypodermatically. Two hours later the pulse, heretofore of good volume and regular, quite suddenly became weak and irregular and beat 130 per minute; temperature 100°, respiration 26. He seemed in profound collapse, the breathing was labored and mucus rattled in his throat. Half an hour later he vomited an enormous quantity of sour, brownish liquid. His abdomen was only moderately distended and not rigid. Salt solution was administered per rectum, and digitalin one-fiftieth of a grain, strychnine one-thirtieth of a grain, were given hypodermatically.

The pulse progressively became more rapid, weak and irregular, until at 10 P. M. it was 160. Before midnight he was given a liter of salt solution under the skin, to which had been added 30 minims of adrenalin and one hundredth grain of atropine. Following this, the pulse became temporarily more regular and strong and numbered 120 per minute. The patient complained bitterly of thirst and weakness.

November 9th, third day. During the night exitus was hourly expected, but in the morning the patient's pulse was 144, he was very restless, thirsty and in a semi-comatose condition. Ten ounces of urine were withdrawn by catheter. Salt solution, adrenalin and digitalin were administered during the day. The patient's most bitter complaints were thirst and extreme weakness. He was turned on his abdomen, and vomited a large quantity of greenish, foul fluid, and after this his condition was somewhat improved.

November 10th, the fourth day after the operation, he was much improved, his pulse was 90 and prostration had nearly disappeared. Calomel administered by the mouth resulted in a copious, greenish, liquid stool in the evening.

He partook sparingly of liquids, and digitalin one-fiftieth grain every four hours was continued hypodermatically. For two days his chart shows nothing remarkable, but on November 13th, the seventh day after the operation, at 4 P. M., he became restless, and his pulse increased to 140, temperature 100°, respiration 24. He again complained of great thirst and weakness and a little later vomited a large quantity of greenish, foul fluid. He was in profound collapse. Salt solution and adrenalin were again used and the stomach was washed out with a large quantity of water. A temporary amelioration of the symptoms followed, but he gradually sank into profound collapse and died at 4:40 the following morning.

The autopsy, twelve hours after death, showed the following: The line of suture in the stomach was firmly healed; there was no leakage. The stomach itself, which, after the partial gastrectomy was only about the diameter of the colon, was now enormously distended, containing two liters of greenish, foul fluid, but possessed of no fecal odor. The dilatation involved the duodenum as far as the point where it is crossed by the root of the mesentery, where it was seemingly constricted by the latter structure. There was no evidence of gangrene of the intestine at the point of constriction. The abdominal cavity contained no fluid, and the peritoneal surfaces were smooth. The liver was small and rich in connective tissue. The spleen was slightly enlarged and tough. The kidneys were unchanged. Heart and right lung were negative. In the middle of the base of the left upper lobe was an old abscess about the size of a bantam's egg, surrounded by a dense wall of granulation tissue.

The moot question is, whether in the gastro-mesenteric ileus type, the compression of the duodenum by the root of the mesentery is the cause or the result of the gastric dilatation.

At the point where the duodenum is crossed by the mesentery there is normally a slight constriction of the intestine, sufficient to hold back the bile

and pancreatic secretion after a meal. The hindrance is normally overcome two or three hours after partaking of food, when the contents of the stomach are poured out into the duodenum, thereby stimulating it to contraction. If the stomach is not possessed of its normal motor power, then there is not sufficient force from behind to overcome this, perhaps, normal constriction and a gastro-mesenteric ileus follows.

A long mesentery with prolapse of the small intestine into the pelvis can certainly produce a constriction of the third part of the duodenum. The removal from the abdominal cavity of large quantities of fluid, large ovarian cysts or myomatous uteri, can produce such intraabdominal vacuity as to allow of the sudden descent of the small intestines with consequent traction upon the mesentery, sufficient to produce this form of ileus, which is maintained and further exaggerated by the downward pressure of the enormously dilated stomach on the small intestines. Thus we have a "circulus viciosus" of phenomena, so often seen in pathological conditions, where the primary etiological factor is maintained and rendered more harmful by some phenomenon which it has produced. This condition has followed normal delivery, with the emptying of the uterus, the small intestines may drop down into the pelvis and thus by traction obstruct the duodenum.

Conner experimented upon ten cadavers; with the bodies in the dorsal position he removed the small intestines, gathered the mesentery up into a mass, fastening a cord around this, allowed it to pass down into the pelvis and out through the anus, where it was allowed to hang free. Different weights were attached to these cords and the stomach filled with water through a tube passing down the esophagus, and the pressure necessary to overcome the duodenal compression by the mesentery estimated by connecting the tube with a mercury manometer. The results varied in different cases. In seven of the experimented cases, a load of 500 grams (the weight of the small intestines) caused an obstruction in the duodenum where the superior mesenteric artery crossed it, which required a water pressure varying from 10 to 46 mm. of mercury to overcome it. In the other three cases the weight even when increased to one kilogram did not produce any duodenal obstruction.

"In order for the mesentery to exert the requisite amount of traction upon the duodenum to produce obstruction, which can not be overcome by the motor power of the stomach, it is thought that certain abnormal conditions render the process more easy, as abnormally long mesentery, general enteroptosis (the fixed part of the duodenum not descending with the other abdominal viscera), a partially twisted mesentery, a partially closed fan-shaped mesentery instead of the open fan-shape, localizing pressure upon the mesenteric root, etc. Schnitzler has found that when the mesentery is inserted to the right of the median line it is easier for a pull upon it to close the lumen than when inserted to the left." (Laffer.)

Byron Robinson (*Cincinnati Lancet-Clinic*, December 8, 1900) examined several hundred bodies to ascertain whether general ptosis of the abdominal organs with relaxed abdominal walls was responsible for mesenteric duodenal compression, and found some twenty cases of definite gastro-duodenal dilatation beginning where the superior mesenteric artery crosses the duodenum. He points out the fixed position of the duodenum as contrasted with the lax, mobile qualities of the rest of the intestines with their mesentery. The jejunum and ileum, with their mesentery, can travel downward, but the duodenum, being fixed, must remain stationary, just where the root of the mesentery crosses it, thus with a relaxed abdominal wall, abnormal pressure at this point can not be prevented. Cerné Phillipe (cited by R. Romme, *Presse Médicale*, January 23, 1909, page 61) has reported an instance of gastro-duodenal ileus produced by a retroduodenal hematoma pushing the duodenum against the superior mesenteric artery and thus causing its strangulation.

Spinal deformity in the lumbar region favors this form of ileus by furnishing a more marked promontory against which the mesentery can compress the intestine.

Following abdominal operations, particularly operations on the gall tract and pylorus, and after the removal of large abdominal tumors, this accident at times occurs; the stomach attains enormous dimensions, and just as in the spontaneous cases, the autopsy shows usually a concomitant existence of a dilatation of the duodenum strangulated by the root of the mesentery. The victim has passed through a typical attack of ileus. The greatest number of cases are of this type.

A. G. Nicholls (*International Clinics*, Vol. IV, 18th series, pages 80-105) collects 225 cases, 47.5 per cent. of which followed operations under general anesthesia. In four of Nicholls' collected cases no definite cause could be determined; in one the condition developed after a violent paroxysm of laughter, and one after fright.

Connor believes that the compression of the duo-

denum by the mesentery is the *sine qua non* to the production of gastro-duodenal ileus, and in this view he is supported by Byron Robinson, Beaurain, Schnitzler, Delagenière, Reynier and others.

Against the theory that this form of ileus is produced by mesenteric compression, we have considerable evidence, for instance, in only one autopsy (Bräumler, *Muenchener Medizinischer Wochenschrift,* April, 1901) was there any necrosis at the point of the duodenal constriction, and we cannot ignore the absence of edema, cyanosis or other signs of venous stasis in the prolapsed intestines, in determining the primary cause.

Of 120 cases autopsied only 27 showed definite mesenteric compression. (Laffer.)

In some, no duodenal dilatation was present, and in at least three instances the distention extended past the duodeno-jejunal junction. Thomsen (*Lancet,* August 2, 1902) cites a case wherein the distention extended throughout eight feet of the small intestines, to terminate abruptly in collapsed bowel, without any demonstrable constricting force.

In only a few instances was any peristalsis to be demonstrated in the dilated stomach, and the pain felt is not of that severe cramp-like character, occurring in pure mechanical obstruction.

Gastrostomy and gastro-jejunostomy have not been of any use as a curative measure.

Experiments on dogs, by Pelling and others (cited by Laffer, *Annals of Surgery,* Vol. 47, p. 415) have shown a few facts as follows: Conscious dogs do not allow of dilatation of the stomach through a gastrostomy wound; the fluid is vomited as soon as the stomach is overfilled. Anesthetized dogs admit of dilatation of the stomach through a gastrostomy wound, to the point of rupture of the walls of the organ. The same occurs if both vagi be cut, or anesthetized by cocaine. Cutting the sympathetic had no effect on the vomiting reflex. Braun and Seidel (cited by Laffer) conclude that acute gastric dilatation can be best explained on the grounds of primary central or peripheral disturbance of the stomach innervation apparatus.

Instances occurring in pneumonia may be initiated by an involvement of the vagi by the specific inflammation in the lungs.

Paul Reynier (*Bull. et Mem. de la Soc. de Chirurgie de Paris,* 1905, Vol. 31) believes that operations on the kidneys can cause acute gastric dilatation by irritation of the solar plexus branches, and likens it to paralysis of the bladder after dilatation of the sphincter ani, where we have irritation or injury of the filaments of the hypogastric plexus.

Vomiting almost always occurs, and if the affection follows an operation it begins at the end of a day or so afterwards, when the post-anesthetic vomiting has, as a rule, ceased. The vomitus is first yellowish, later becoming greenish and black in color, of foul, though rarely fecal odor, very large in amount, and expelled without much nausea or straining. Obstipation is the rule. The thirst is extreme and most agonizing. The urine is much diminished in quantity, and, as in other forms of ileus, a delirium at times precedes the exitus.

The striking features are early, intractable, pernicious and copious vomiting, thirst, profound collapse, and abdominal distention corresponding to the extent of the gastric dilatation.

The diagnosis can be rendered clear by the insertion of the stomach tube, when the enlargement of the abdomen can be demonstrated as being due to the enormously dilated stomach, which in some instances extends as low as the symphysis pubis.

Treatment.—Because we are not certain of the pathology of this affection, it would seem advisable to institute methods of treatment calculated, in the first place, to keep the stomach clear of the ever accumulating noxious fluid and to stimulate the supposedly paralytic viscus. The first is accomplished by frequent gastric lavage, and the second by the administration of such remedies as physostigmine and ergot, hypodermatically; and in the second place, one should aim by postural methods, to undo the viscious mesenteric constriction of the duodenum, and this is accomplished by placing the patient on the abdomen and elevating the foot of the bed three or four feet.

In the words of Romme (*Presse Médicale,* January 23, 1909): "Under the influence of this position there occurs a complete change in the clinical picture; vomiting and pain cease, the collapse disappears, and sometimes a cure is complete in the space of a few hours."

Delagenière and Reynier, at the meeting of the Paris Surgical Society, March 10, 1909, were loud in their recommendation of the postural method as a cure for this acute duodenal obstruction, and they were seconded in their view by Lucas Championniere and Pierre Delbet (*Presse Médicale,* March 20, 1909).

The ventral position relaxes the taut mesentery and causes the duodenal constriction to disappear.

Of course, it is necessary that the patient should not take anything by the mouth.

The collapse is to be combated by the administration of large quantities of physiological salt solution, either per rectum or under the skin.

The ergot, given with a view to stimulating the

gastric atony, acts also as a good cardiac and vascular stimulant, and the shock may be further combated by the frequent use of adrenalin.

The surgical treatment has yielded very discouraging results. Those patients upon whom a gastrostomy has been performed have all died. (Laffer.)

C. A. McWilliams (*Surgery, Gynecology and Obstetrics*, September, 1908) suggests that one perform a high jejunostomy and drain the duodenum, and even the stomach, through a tube passed by way of the jejunostomy wound into the duodenum and, if thought advisable, clear into the stomach. A tube could also be passed distally into the jejunum for the administration of cathartics, stimulants and nourishment. Meanwhile, the stomach should be washed frequently.

Posterior gastro-enterostomy has not given good results, and this would seem to disprove the theory that duodenal compression is the sole etiological factor.

Bloodgood (*Annals of Surgery*, Vol. 46, p. 746) suggests the performance of a duodeno-jejunostomy for the purpose of draining the duodenum and stomach, where medical means fail.

The conclusions drawn are that: The weight of evidence, as gleaned from the literature, favors the theory that there is primarily a central or peripheral disturbance of the innervation of the stomach, and that the duodenal compression is secondary, in the majority of instances; but it is decidedly advisable, so far as treatment is concerned, to regard mesenteric compression of the duodenum as a most important factor in the production and maintenance of this syndrome; the mortality can be reduced by early diagnosis and the institution of appropriate treatment, and the treatment should rarely be operative.

ACIDEMIA AND ACIDOSIS.

When the normal alkalinity of the blood is diminished and there is an excess of acid substances in the blood, an acid intoxication results which is called by some acidosis and by others acidemia. Both terms are correct, but since the word acidosis is almost invariably associated with serious organic lesions, such as are present with diabetes mellitus, after chloroform anesthesia, and in other serious toxic states, I believe that the term acidemia is more appropriate for the condition.—HENRY R. HARROWER in the *Medical Record*.

RESULTS OF THE USE OF BISMUTH PASTE IN TUBERCULOUS SINUSES AT THE SEA BREEZE HOSPITAL.

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Following out the ideas of Dr. Beck, of Chicago, we have been injecting the infected sinuses of the children at the hospital with bismuth paste. We used at first his formula containing paraffin and white wax, but shortly abandoned this, and have since used his later formula, a mixture of one part bismuth subnitrate to two parts vaseline. Dr. Beck visited the hospital in the summer of 1909, and demonstrated his exact technic, and this has since been closely followed.

A summary of the cases follows:

Case I. M. G., girl, age ten years. Lumbar Pott's disease, second, third and fourth vertebrae, with well marked deformity, double psoas contraction, etc. Duration of disease, eight years. Duration of suppuration, four years. No signs of amyloid degeneration. Positive Calmette test, January, 1908. Four sinuses, one in each groin, one in right buttock, and one over left trochanter. Injections begun December 2, 1908. Immediate improvement. December 23, 1908, sinuses healed. Later they broke out again, and injections were resumed. On May 1, 1909, they were again healed, and did not afterward break down. On May 5th an abscess had formed a few inches from the mouth of the sinus in the buttock, as if the pus had been dammed back. This was twice aspirated, and injected with Calot's iodoform-ether mixture, and did not break down again. There was no sign of abscess formation in September, 1909.

Summary: Tuberculosis of spine. Twelve bismuth injections. Cure of sinuses in five months.

Case II. T. E., boy, age eight years. Left hip joint disease. Duration of disease, four and a half years. Duration of suppuration, about twenty months. Typical attitude of hip joint disease, muscular atrophy, and limitation of motion were present. Calmette tuberculin test was positive. This boy had had several sinuses, and but one persisted at the time the bismuth injections were begun on January 10, 1909. The injections were continued for two weeks. On February 21, the sinus had healed, and remained closed thereafter.

Summary: Tuberculosis of left hip. Three bismuth injections. Cure of sinus in six weeks.

Case III. I. G., boy, age five years. Right hip joint disease. Duration of disease unknown. Duration of sinuses, two weeks. Bismuth injections begun on April 4, 1909, and continued for six weeks. On June 12 the boy was removed from the hospital by his parents.

Summary: Tuberculosis of right hip. Three injections. No improvement.

Case IV. M. M., girl, age 13 years. Tuberculosis of right knee. Duration of disease, ten years. Duration of sinuses, over four years. Bony ankylosis had taken place with knee in moderate flexion, and the child had gone without apparatus for about eight months. Positive Calmette test on January 8, 1908. The suppuration, which had been profuse, had grown much less, and but one sinus remained with very slight discharge when the bismuth injections were begun on April 4, 1909. They were continued until August 18, when the patient was discharged with a minimal amount of pus. During part of the time Bier's hyperemia was used. In October, 1909, the child was seen at the Roosevelt O. P. D., and no sign of suppuration was present.

Summary: Suppuration following tuberculosis of right knee. Nine injections and hyperemia for a short time. Cure in about six months.

Case V. J. E. S., boy, age eight years. Right hip disease. Duration of disease, about four years. Duration of sinuses, nineteen months. Calmette reaction positive January 8, 1908. Typical hip joint disease, with characteristic deformity, atrophy, limitation of motion, infiltration about the head of the femur, elevation of the trochanter, etc. Several sinuses had been present, and but one remained, discharging a small quantity of pus, when the injections were begun on December 13, 1908. They were continued until February 28, 1909. On March 21, a plaster spica was applied, and no further suppuration was noted. When the boy was examined on August 18, and again in September, 1909, the sinuses were closed.

Summary: Tuberculosis of right hip. Three bismuth injections. Cure in about four months.

Case VI. R. S., girl, age ten and a half years. Right hip joint disease. Duration of disease, three and a half years. Duration of sinuses, about two years. January 8, 1908, Calmette reaction positive. May 24, 1908, liver and spleen much enlarged. Under mercury and the iodides the patient had improved somewhat, but the whole upper end of the bone was evidently diseased, as well as the ilium. Amputation had been urged and refused. Bismuth injections were begun on January 20, 1909, and continued for about two weeks. The general condition of the child became steadily worse, the kidneys were affected, and because the parents still refused amputation, the child was discharged as incurable on March 28, 1909.

Summary: Tuberculosis of right hip, amyloid degeneration. Three bismuth injections. No improvement.

Case VII. W. C., boy, age five and a half years. Right hip disease and thoracic Pott's disease. Duration of disease, two and a half years. Duration of sinuses, thirteen months. Typical symptoms of disease of hip and spine—kyphosis, infiltration about hip, atrophy, limitation of motion, etc. January 8, 1909, positive Calmette reaction. Liver slightly enlarged, albumin in urine. Emaciation and fever were present and child was in bad condition. Bismuth injections were begun on December 2, 1908, and were continued for about three and a half months. After the seventh injection they were omitted for one month on account of nausea and vomiting. The boy's general condition grew slowly worse. An amputation was twice urged and refused, and on May 5 the patient was discharged as incurable.

Summary: Tuberculosis of hip and of spine. Amyloid degeneration of viscera. About ten bismuth injections. Temporary improvement, which did not persist.

Case VIII. M. K., boy, age six years. Tuberculosis of elbow; axillary adenitis. Duration of disease, three years. Duration of sinuses unknown. Boy in poor condition. Right elbow greatly swollen and infiltrated; riddled with foul discharging sinuses. The elbow in semi-flexion and practically without motion. The lymph nodes in the axilla broken down and inflamed, and discharging freely. Moro test positive. Under wet dressing, mercurial ointment, and congestive hyperemia, the joint improved greatly. For about two weeks the bismuth injections were tried, but without result. At date of writing, a large sequestrum is visible on the external aspect of the joint, and will be removed.

Summary: Tuberculosis of elbow. About three bismuth injections. No improvement.

Case IX. T. P., boy,age ten years. Left hip disease. Duration of disease, two years. Duration of sinuses unknown, probably only a few days. Typical tuberculous hip—induration about the joint, muscular spasm, limitation of motion, great pain, etc. The boy entered the hospital wearing a brace, and had a ruptured abscess which had not become infected and was discharging freely. The abscess had not ruptured when he was examined for admission shortly before. His brace was removed forthwith, and he was put to bed with traction on the extremity, and the bismuth injections were begun at once. They have been continued to date, for a period of about two months, at intervals of one week. The discharge became less immediately. At first the abscess cavity held about 50 c.c. of the mixture; later it would hold only about 10 to 15 c.c. During all this time the abscess has not become infected, and discharges very little. The most recent development of the case was the appearance of deep fluctuation over the trochanter. An aspirating needle was thrust in, about 30 c.c. of thick, flocculent tuberculous pus were withdrawn, and 7 c.c. of Calot's iodoform-ether mixture were injected.

Summary: Tuberculosis of elbow. Ten bismuth injections to date. Steady improvement. Abscess has never become infected.

Case X. T. R., boy, age six years. Left hip disease. Duration of disease, three years. Duration of suppuration, one year. Typical hip joint disease. Almost the entire period of the disease had run in the hospital, with the usual deformity, night cries, atrophy, infiltration, etc. January 8, 1908, Calmette reaction positive. On December 8, 1908, bismuth injections with white wax and paraffin added were begun, and were continued for about one month. At the end of that time, on account of an attack of fever, nausea, and vomiting,

they were stopped, and were not begun again for about three months. Thereafter only the bismuth and vaseline were used, and the sinuses were injected every four or five days, when they would admit the mixture. The discharge grew less, and in four months more the sinuses were closed, and a short plaster spica was applied. Two and a half months later one sinus broke down again and discharged freely. Bismuth injections were immediately resumed, and eighteen days later, at date of writing, the discharge had almost ceased.

Summary: Tuberculous hip. Thirteen injections. Sinuses cured in seven months. Two and one-half months later one sinus again broke down, and after three injections during eighteen days had almost healed. In the light of our experience with Case I, it seems that had the spica not covered up the joint, the abscess might have been aspirated and injected with iodoform mixture, and perhaps might have been prevented from rupturing.

Case XI. R. D., boy, age six years. Tuberculosis of left calcaneus. Duration of disease, one year. Duration of suppuration, eleven months. Four curettings had been done on the foot, the last at the Roosevelt Hospital, whence the child was sent to us with a diagnosis of tuberculous osteomyelitis of the os calcis. He presented one sinus below and behind the external malleolus with a thickening of the bone about it. Moro test positive. For a month after admission Stauung was applied, and then this was stopped, and the sinus was injected by Dr. Beck personally. It healed promptly and remained closed for two months. Then, with the idea of hurrying the healing, Bier's treatment was again started, and the sinus forthwith broke down.

Summary: Tuberculosis of calcaneus. One injection. Cure. Beginning of suppuration again after hyperemia.

Case XII. J. B., boy, age ten years. Tuberculosis of right calcaneus. Duration of disease, six years. Duration of suppuration, about six years. Several operations had been done. Patient had had anti-syphilitic treatment in addition. Shortly after admission to Sea Breeze, he received two bismuth injections, which aggravated the symptoms. He was transferred to one of the large city hospitals, where a thorough operation was done, chiseling away the diseased bone. The condition of the foot became so bad that amputation was strongly advised, and the boy was taken back to Sea Breeze with the idea of saving the foot. He improved rapidly with hot saline baths, and then more slowly under Bier treatment. Four and a half months later bismuth injections were resumed and have been continued at weekly intervals to date, four months. Midway in this course of injection a piece of dead bone was removed from sinus. The sinuses still discharge to a small extent. The Moro test in this case was positive.

Summary: Tuberculosis of calcaneus. Two bismuth injections, containing paraffin and white wax; aggravation of symptoms. Operation. After interval of about six months from first injection, the injections were resumed with bismuth and vaseline. Eighteen injections. Some improvement.

Case XIII. T. D., boy, age twelve years. Tuberculosis of left calcaneus. Duration of disease, one year. Duration of suppuration, unknown. Two operations have been done on foot. The boy presented a typical picture of the disease. After a diagnostic course of anti-syphilitic treatment, he received two bismuth injections with paraffin and white wax added, into his single sinus. These seemed to aggravate the symptoms, and the patient was sent with Case XI to Manhattan and was operated on at the same time as that patient. A piece of dead bone was removed at operation. This patient returned at the same time as the other, with discharge from two sinuses. At the same time as in the case of patient XI, injections of bismuth and vaseline were begun again, and were continued for about six weeks at weekly intervals without improvement. They were then stopped.

Summary: Tuberculosis of calcaneus. Two bismuth injections containing paraffin and white wax. Aggravation of symptoms. Operation. After interval of about six months from first injection, the injections were resumed with bismuth and vaseline. Seven injections. No improvement.

Case XIV. V. B., girl, age twelve years. Adenitis. Duration of disease, nine years. Duration of suppuration, about nine years. More than thirty operations had been done on this patient. She had numerous scars about the neck, axillæ, etc., in many of which were discharging sinuses. She came to the hospital with a diagnosis of tuberculous adenitis, but her prompt and satisfactory response to mercury and the iodides, and the "punched-out" appearance of one of the sinuses made us sceptical of the diagnosis. In the midst of the treatment she was removed from the hospital by her mother on account of the approach of cold weather. While in the hospital she had five injections of bismuth and vaseline, during a period of three weeks, but improved little, if any. The Moro test was positive.

Summary: Suppurative adenitis, unknown cause. Five bismuth injections. No improvement.

In cases 1, 7, 10 and 11, the first two or three injections contained paraffin and white wax. In the other cases, bismuth and vaseline were used with no other ingredients. Care was used, as Beck insists, to prevent the entrance of any water into the mixture, and the mixture was made into a thoroughly homogeneous mass. It was heated in a water bath, and the large glass syringe, bought especially for the purpose, after Beck's ideas, was boiled and then washed out with alcohol before being used. The mouths of the sinuses were also wiped with alcohol before injection, and the mouths of communicating sinuses were stopped by gauze held over them. The injection was done with as much force as the patient could tolerate, as soon as the mixture had cooled enough; that is, as soon

as it felt only warm to the back of the hand. Contrary to Beck's experience, we found the procedure almost always somewhat painful. The usual interval was about a week.

Of our cases a few words may be said in explanation. In Case 1, the sinuses had existed for a long time and showed no sign of healing when the injections were begun. We therefore regarded the cure as directly due to them. Case 2 was in the stage of repair when the injections were begun. We regard the cure as hastened by them. The same may be said of Case 4, but part of the improvement here may have been due to the hyperemia treatment. In Case 5 the sinuses were also in the stage of repair when the treatment was begun.

There are several facts that stand out in a study of these cases. First, that the infected sinuses from a case of Pott's disease healed up while the bismuth injections were being used. This one thing is enough to justify an extended use of the treatment, for heretofore an infected sinus from Pott's disease was considered the patient's death warrant. Second, that a rather long sinus in a case of hip joint disease, with necrosis of the tissues at its mouth, has for months been kept from secondary infection. Third, that the case of the elbow with a sequestrum was not benefited at all. This agrees with what Beck has already said. Fourth, that in the presence of visceral involvement the injections are of little use. Fifth, that the bismuth is of more use in old infected sinuses than in recent ones. Sixth, that in our cases of tuberculosis of the calcaneus the injections were not of much value. The one case of our series that was helped by them was not a typical case.

In the past few years our attitude toward tuberculous abscesses has undergone a complete change. Instead of sitting with folded hands and permitting them to rupture and become infected, and then watching the patient fight out the mixed infection as best he can, we attack them before they rupture with the aspirator, and inject their cavities with iodoform mixtures. If, in spite of all our efforts, they rupture, then we inject them with bismuth paste and try to prevent secondary infection. In the face of a mixed infection we can still hope for results from bismuth or from the hyperemia treatment of Bier.

Suturing liver tissue must be accomplished with ease and with the most simple means in the hands of every operator. This is accomplished by Frank's method.

THE ROENTGEN DIAGNOSIS OF THE MORE COMMON INJURIES AND DISEASES ABOUT THE HIP JOINT.*

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Before the advent of the Roentgen ray, with its ability to penetrate the tissues of the body, diagnoses were dependent upon clinical symptoms or operative findings. Because of this power of penetration of tissues of different densities to a varying degree and the recording of the result on the skiagraphic plate, we may in a harmless and painless way, without inconvenience or discomfort to the patient, determine the pathological conditions present with a fair degree of accuracy. The question of diagnosis then depends upon a careful study and proper interpretation of the shadows thus obtained without reliance upon uncertain clinical signs and symptoms or the ordeal of an exploratory incision. Then, too, there are some conditions, transitory in nature, from which the patient recovers without surgical interference, and not often seen at autopsy which can be determined only by the use of the *x*-ray.

This paper must necessarily be in the nature of a preliminary report because of the scarcity of material at the writer's disposal and his consequent inability to draw accurate conclusions in regard to many of the conditions presented; and the privilege is reserved of modifying at a later date such statements as may be proven upon further investigation to be inaccurate.

The hip-joint and the region of the hip are taken as a subject of study because the thickness of the part renders clinical diagnosis more difficult than in other regions and also because it is subject to all the forms of osseous and arthritic disease found in any part of the body.

Contusions, when of the soft parts alone, present no tissue changes demonstrable by means of the *x*-rays. But should the injury involve the bone there is a roughening or "fringing" of the periosteal border and the affected bone area appears dark, indicating a loss of density of the bone substance—a destruction, or at least a lessening of the vitality of the minute bony trabeculæ at that point. This is merely an inflammatory change, not necessarily necrosis, and is the simplest change occurring in a bone—occurring frequently in the great trochanter, but are more or less mottled, the spaces between the

* Read before the Long Island Medical Society, May 4, 1909.

trabeculæ being increased in size and the trabeculæ themselves appearing irregular and hazy. This is the condition—traumatic ostitis or contusion of the bane—occurring frequently in the great trochanter, which is often found in cases where the symptoms last over a long period, weeks or even months; and it is at times mistaken for a more serious injury to the bone or even disease of the joint.

Fractures.—Probably there is no other part of the body where fractures are of so many varieties and at so many different points as about the hip. Because of the thickness of the part, direct palpation of the bone is often impossible and Roentgen observers not infrequently find the clinical diagnosis at variance with the facts. Fractures, being solutions of continuity of bone, afford instant recognition on the plate. The density at the point of fracture, being lessened, there is a dark shadow, clear and uniform, in contrast with the normal bone. Even a fissure changes the density at the point of the lesion and is easily demonstrable. Where there is displacement of the fragments, the change in outline makes the nature of the condition at once apparent. A slight irregularity in the outline of the neck or a shortening of the distance from the great trochanter to the rim of the acetabulum may be the only evidence of a fracture of the neck of the femur, especially when it is impacted. But it is especially the unusual conditions such as the chipping off of part of the rim of the acetabulum or driving of the head of the femur through the floor of the acetabulum that present features which, often puzzling to the surgeon, are determined only by means of Roentgen examination. The last named is occasionally the true condition in cases diagnosed as "impacted fracture of the neck of the femur."

Dislocations need but slight mention as their presence is readily determined by ordinary examination and, excepting the abnormal relation of the head of the fumur and the acetabulum, they present no special features on the *x*-ray plate.

Bone diseases are of especial interest because of the difficulties offered in determining the presence and true nature of the condition in differentiation from disease of the soft tissues, and the exact location of the lesions.

Periostitis, when of the simple variety and existing alone, is not apparent on the *x*-ray plate, but with subperiosteal abscess, an area, the density of which is even less than that of the soft parts (evenly dark on the plate) may be present.

Ostitis, of whatever variety of etiological factor, has as its characteristic feature, the destruction of bone cells. This, causing lessened density, produces on the skiagraph dark areas in the bone in contrast to the adjacent healthy bone; but with differing etiological factors different pathological changes occur, and the varieties of ostitis may be thus distinguished.

Simple ostitis has been described under "Contusion of Bone." Similar changes occur when the periosteum and underlying bone have been injured by the tearing away of a ligament or tendon from its osseous attachment as in a sprain or severe strain.

Tuberculous ostitis may exist in the region of the hip without its being a true joint involvement. The general pathology of tuberculous lesions in any part of the body reveals the condition to be one in which there is destruction of the original tissue with replacement by inflammatory tissue or products, which later break down to necrosis. In tuberculous disease of bone, the process is essentially a destructive one and is always indicated by lessening of the bone density with or without change in the outline, according to whether there be loss of substance at the periphery or not. The disease may originate within the substance of the bone itself, or it may be secondary to a periostitis or joint infection. The favorite primary sites are in the head of the femur, in the great trochanter or in one of the epiphyseal lines. The acetabulum is often affected, seldom, if ever, as a primary lesion, but usually secondarily to disease of the joint.

In its early stages, the disease manifests itself on the skiagraph as a dark area within the bone shadow, near its periphery or as erosion of the periphery. When located at the epiphyseal line, there is erosion of the contiguous borders of the bone with hazing of the intervening space from the presence of inflammatory or necrotic products. The adjacent bone is frequently dark from extension of the disease into it. Later, with progression of the disease, the amount of destruction may be great as evidenced by deficiencies of considerable extent.

The characteristic features of bone tuberculosis are the presence of a process that is wholly destructive, and the fact that the lesions, usually single, occur at or near the periphery of the bone or in the line of an epiphyseal junction.

Syphilis of bone manifests itself as periosteal thickening, rarefaction of the cancellous portion of the diaphyses and the formation of gummata within the medullary canal or on the cortex.

The periosteal thickening results in an irregular enlargement of the shaft of the bone giving the ap-

pearance of a thickened cortex—clear and uniformly light.

The rarefaction at the ends of the bones, caused by the destruction of the bony lamellæ, produces the characteristic shadows of lessened density, but it is not solid, but "streaky" from the presence of healthy bone within the affected region.

Gummata, whether within the medulla or on the cortex, have a clear, structureless appearance, very irregular in outline, and of about the same density as the cortex itself. The new-formed tissue in any part may break down, then showing itself as solid dark areas or as erosions on the surface of the bone.

Infectious ostitis.—It has been found that any bacillus may find lodgment in the bones and there set up an inflammatory reaction. This is the case with the occurrence of joint or bone symptoms during the course of or following one of the infectious diseases, the organism of the disease being the inciting agent of the local condition. It seems that cancellous tissue is affected by preference and the head of the femur is a frequent seat of invasion. The lesions produced are often, and in fact usually, multiple and appear as simple darkened areas, the edges being clean-cut and distinct. It may be distinguished from the tuberculous lesion by its multiplicity and from the fact that it is deep-seated and not adjacent to the periphery of the bone.

With extensive involvement, and softening of a considerable portion of the bone, it may be deformed from pressure. This is common in the head of the femur. The lesions of infectious ostitis show but slight tendency to break down.

Among the varieties of ostitis, there is another form to be mentioned—metastatic malignant disease. This occurs usually in the cancellous tissue, but at times is noted in the shaft as well. It is frequently recognized clinically only in its latest stages when it manifests itself as a fracture. The disease begins in the bone substance as a small inflammatory area (dark spot on the plate) and then by extension involves the entire section, progressing to irregular peripheral outgrowths, such as are seen in syphilis. In its late stages, its appearance is very similar to that of syphilis except that it never breaks down to necrosis or liquefaction.

Osteomyelitis.—Grouped under this heading will be included bone cysts, abscesses, and osteomyelitis involving large areas. Cysts and abscesses, or local areas of osteomyelitis present similar appearance on the *x*-ray plate and cannot be differentiated. In all, the conditions depend upon the chronicity of the disease. In the simple acute varieties, the disease manifests itself as a well defined, local, dark, almost black, shadow occupying a part of the medullary canal with or without a local destruction of the cortex. The extent of this area corresponds with the area of the disease. Necrotic tissue cannot always be distinguished from abscess, but this is unimportant from a practical standpoint.

Chronic osteomyelitis or chronic abscess presents the same features as the acute with an additional enlargement of the whole bone in the affected region from a thickening of the periosteum. This is usually irregular in outline and at times presents a dark shadow in its substance, or a deficiency, where the disease has extended to the surface.

Benign New Growths.—Of these the most frequently encountered are exostoses. They appear as dense projections from the surface of the bone, more or less irregular in outline, with clean-cut edges, and of a density often varying in different parts, but without the striæ seen in normal bone. The bone at the base of the growth shows as a rule no change.

Osteosarcoma occurs in two varieties: periosteal and central, according to the primary seat of the lesion. Periosteal sarcoma, from its name, originates from the periosteum of the bone and is not so dense as the bone itself. In its early stages it does not produce changes in the underlying osseous structure from which it springs. Later, however, this is invaded and in addition to the tumor mass, there is destruction and consequently a deficiency in the outline of the mother part. The tumor mass has no characteristic appearance, but is practically homogeneous; but the destroyed portion of the bone is observed as a dark area of lessened density.

The central variety of sarcoma, however, appears in the skiagraph, at first simply as an inflammatory ostitis, or as an osteomyelitis, a darkened area, with the occurrence later of irregular masses along the periphery. Some may even be detached. These are clear and structureless, of considerable density, but not so great as that of the bone.

The diagnosis of diseases of the hip-joint is dependent upon the appearance of the joint itself and of the adjacent bony parts. Acute *synovitis* produces no change demonstrable on the *x*-ray plate. When chronic, however, with the deposition of inflammatory material, there is a hazing of the joint space. This holds true regardless of the etiological factor, the degree of density depending upon the amount and nature of the foreign material present.

In practically all cases of disease of the bone adjacent to or including the articular surface, there is involvent of the joint, hence this haziness is present. This is the factor which differentiates a true arthritis with osseous involvement depending upon or accompanying it, from an ostitis of those parts without joint involvement. The picture of hip-joint disease, whether of traumatic, tuberculous, gonorrheal, typhoid or other origin is, therefore, the picture of a synovitis together with the changes in the adjacent bone characteristic of that particular disease.

Osteo-arthritis, however, stands out as a distinct pathological entity. Hypertrophy and atrophy of the bones are usually coexistent in the same joint and either term is applied according to the preponderance of that process. In the early stages, hypertrophy is most marked and the presence of osteophytes about the rim of the acetabulum and below the head of the femur characterize the condition. Later, erosions occur, most frequently at the seat of the earliest lesions. Then follows destruction of the cartilages with approximation of the bony parts. In the late stages, with marked softening and atrophy, the loss of bone substance may be considerable, producing great deformity. The deposits appear as clear and homogeneous masses on the skiagraph and the softened or eroded areas appear dark.

As stated at the outset, consideration has been given to only the more common affections, the ones with which the physician has most frequently to deal. Insufficient study has as yet been devoted to the Roentgen appearance of many of the lesions, and the appearances described cannot be said to be absolutely pathognomonic. But at the same time these data, scanty and incomplete though they may be, when studied with the clinical findings, are of great assistance in lessening some of the difficulties of diagnosis in lesions about the hip, and of the osseous parts elsewhere in the body.

382 ADELPHI STREET.

CONCERNING THE DIAGNOSIS OF FRACTURES.

In many . . . cases it is sufficient to establish the probability of the existence of a fracture. We do not need to take counsel of perfection. We do not need to know all the details, and we have the right to seek only for those the knowledge of which can be made use of in our treatment. We can rest upon our knowledge of the type of fracture at the part concerned.—LEWIS A. STIMSON in the *N. Y. State Journal of Medicine.*

SOME REMARKS ON THE SURGICAL TREATMENT OF GOITER.*

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Although the subject goiter has been labored over by patient experiment from many points of view, it still presents a large number of unsolved problems. Our knowledge of the subject like that of the aeroplane, is of necessity in its infancy.

The toxic bodies that are so freely thrown into the circulation in cases of exophthalmic goiter must surely have their antidote and this in coming years will enable us to save many lives.

The treatment of the future will, I believe, be a combination of the serum treatment with the surgical removal of a portion of the gland; we shall have an antidote—a remedy will be found that will give temporary relief, will tide the patient over a period of depression and danger. This will remove the risks of heart failure and make the operation safe. We know now the use of serum made from fresh gland tissue can lessen the secretory activity and neutralize the toxines secreted so that even at this developmental, experimental stage we have a therapeutic agent of definite value.

The attempt to resect a thyroid gland from an intensely nervous patient whose heart is running away from overstimulation (I use the term for want of a better one), is, to say the least, ill-advised. In such a case we should resort to preliminary rest in bed, ergot, bromides, digitalis, the injections of serum, etc., in an effort to secure temporary equilibrium before the shock of the knife.

As regards the technic of the operative treatment there are yet, as in many other troubles, certain variations, but at present most operators have agreed that it is advisable to leave the posterior capsule and thus run less risk of removing the parathyroid glands; when this method is followed there is but little danger of injury to the laryngeal nerves.

The Kochers have shown that preliminary ligation of the superior thyroid arteries not only reduces the enlarged gland in size, but makes the operation of removal far more safe.

The many advantages of mental suggestion at the time of operation, as suggested and practiced by Crile, have been demonstrated and this constitutes a noteworthy advance in the treatment of exophthalmic goiter.

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* Read before the Mississippi Valley Medical Association, 1908.

Prior to operation the pulse, if rapid, should by all means be reduced—otherwise the mortality risks will be unnecessarily high. The best means of reducing the pulse is by the combination of rest in bed and the administration of digitalis. In some cases no preliminary treatment will bring about any temporary improvement, apparent or otherwise. These cases are the most dangerous—they usually have degenerated hearts, albuminuria and retrograde changes in various organs of the body.

In most of my cases local anesthesia has been used. If the patient is very nervous ether is given as soon as the patient begins to complain much. The average patient, if properly encouraged, will not require general anesthesia.

The rapid and effective control of bleeding is the principal difficulty that presents itself to the operator. In applying clamps to the capsule the usual caution to apply the hemostats longitudinally rather than laterally should be observed. A whip-stitch of plain catgut on a round needle is a most effective agent of hemostasis.

Experimentally it has been well established that the ligation of the blood supply *en masse* with the gland substance, in combination with the application of deep pursestring sutures to the substance of the gland, gives marked benefit in most cases, and it should certainly be used as a preliminary to operation in many of the severer cases. There is no danger of gangrene as the blood supply is too rich to make that accident possible.

At one time it was taught that the cut raw gland surface should be swabbed with iodine, Harrington's solution, or other similar solution with the intent to prevent absorption of toxic substances from the gland. This is unnecessary and may retard healing. If we wash out the wound with normal salt solution and insert a rubber drainage tube through a small stab wound under the line of incision the results will be good.

An infected suppurating goiter may be one of the worst possible conditions to treat. I have one such on hand at the present time which has been draining pus week after week with no sign of abatement. In this case a large simple goiter became intensely inflamed without apparent cause. The patient was brought to me for thyroidectomy, but this being deemed dangerous a drainage incision was made instead.

COYLE AND RICHARDSON BUILDING.

REPORT OF A CASE OF INTESTINAL OBSTRUCTION WITH GANGRENE OF MECKEL'S DIVERTICULUM, DUE TO TWISTING.*

E. A. PARKER, M.D.,

Surgeon to Williamsburg and St. Mary's Hospitals,

BROOKLYN, N. Y.

M. S., female, aged thirty-nine, married, native of the United States. She enjoyed good health, excepting occasional "bilious attacks," until December 23, 1904. That evening after eating heartily, she retired, to be awakened five hours later with intense, intermittent, abdominal pains and vomiting. Similar attacks occurred daily after eating.

January 2, 1905, the vomit had a fecal odor; but this symptom did not recur until January 6th, at which time, in addition to stercoraceous vomiting the abdomen became distended and there could be detected a large, tender, indefinite mass, occupying the epigastric and right hypogastric regions.

The patient was operated upon that evening at St. Mary's Hospital. Abdominal section revealed distended intestine and a gangrenous Meckel's diverticulum. The tip of the diverticulum was attached to small intestine and in the loop thus formed knuckles of small intestine were constricted. The diverticulum was twisted three times upon itself. The tip was separated from its attachment and the diverticulum, without a mesentery, was treated similarly to the removal of the appendix, which organ it closely resembled, by Dawbarn's purse-string suture method, reinforced with Lembert sutures.

From the history and findings in this patient, it would appear that on January 2nd, the intestine was caught in the loop and twisted the diverticulum; the intestine after a few hours became released, but the diverticulum remaining twisted, the blood supply was interfered with and gangrene set in; January 6th, intestine again became constricted in the loop and gave the symptoms which called for operative interference.

In the *British Medical Journal*, Vol. 11, 1897, T. Carwardine reports a child, two days old, operated upon and a cyst containing meconium opened. The day following operation, autopsy showed a meconium-containing cyst produced by volvulus, three turns, of Meckel's diverticulum. A fine cord connected the cyst with the bowel below it. and a minute stalk, admitting a bristle, attached it to the distended bowel above.

In the same journal, Vol. I, 1901, K. Campbell reports as the post-mortem finding in a male aged seventy, who had died with symptoms of intestinal obstruction, Meckel's diverticulum attached by its tip to a gland in the crural canal. The diverticulum was gangrenous as a result of being twisted one and a half times upon itself.

* Presented before the Brooklyn Surgical Society.

American Journal of Surgery

PUBLISHED BY THE

SURGERY PUBLISHING CO.

J. MacDONALD, Jr., M.D., President and Treasurer

92 William St., N. Y., U. S. A.

to whom all communications intended for the Editor, original articles, books for review, exchanges, business letters and subscriptions should be addressed.

SUBSCRIPTION PRICE, ONE DOLLAR
FOREIGN, SIX SHILLINGS

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, JANUARY, 1910.

JONNESCO'S CONTRIBUTION TO SPINAL ANESTHESIA.

In 1885 J. Leonard Corning, of New York, demonstrated that complete anesthesia of the lower portion of the body could be produced by the injection of cocaine solution into the spinal canal. The procedure remained little more than a physiological experiment until 1899, when Bier reintroduced it as a surgical measure. But after careful observations Bier himself asserted that the spinal route would not be acceptable for the production of anesthesia until there was found some substitute for cocaine that is free from its disagreeable by-effects.

With the discovery of stovaine by Fourveau, about five years later, and the introduction of eucaine, novocaine, and tropococaine, interest in spinal anesthesia revived. With these newer anesthetics, sometimes combined with adrenalin, spinal anesthesia became a frequently practiced procedure, especially abroad, and, to date, its statistics cover many thousand cases, most of them of injections in the lumbar region. These statistics showed that the introduction of anesthetics into the spinal canal, as it has been practiced, was by no means free from danger. Its record of mortality by respiratory paralysis and otherwise, is 1 in 650 cases (much greater than that of chloroform!); and there have been reports of permanent paralysis, of the sphincters and of the lower extremities, and gangrene of the feet, following its employment.

At the Surgical Congress held in Brussels in September, 1908, Professor Thomas Jonnesco of Bucharest reported that he had adopted a mode of spinal injection which was not only free from danger but also could be used to secure analgesia of any part of the body. For the first purpose, viz., to obviate depression of the higher nerve centers, he added neutral strychnine sulphate to the anesthetic solution (he prefers stovaine). For the second purpose, he made his injection at a level of the spinal column appropriate to the region to be operated upon. His report at Brussels related to 603 operations under lumbar analgesia by stovaine without strychnine, and 14 medio-cervical or superior dorsal injections of stovaine and strychnine (for operations on the head, neck, thorax, upper extremities).

In a later report (*British Medical Journal*, November 13, 1909; *Deutsche Medizinische Wochenschrift*, December 9, 1909), covering a second series of 398 operations under rachistovainization Jonnesco announced that he had discontinued the medio-cervical injection as unnecessary and dangerous [*sic*]. "It favors the appearance of bulbar phenomena—nausea, vomiting, pallor of the face, faintness, momentary stoppage of respiration, and so on, phenomena due to a too direct action of the anesthetic fluid on the bulb." Medio-dorsal puncture he has also abandoned as difficult and unnecessary. He now employs but two sites of injection, viz., between the last dorsal and first lumbar vertebræ for operations on the abdomen, perineum and lower extremities, and between the first and second dorsal vertebræ for operations on the head, neck, thorax and upper extremities.

Jonnesco's second series of 398 operations includes 103 by this high dorsal analgesia, of which 14 were operations on the skull and 45 operations on the face. "If with the higher dorsal injection it is desired to obtain analgesia [*sic*] of the head and neck, the patient is made to lie on his back" immediately after injection. "If after four or five minutes the analgesia [*sic*] of the head or of the neck is not complete, the patient's head should be lowered below the level of the body for three or four minutes." That anesthesia or, to use the term to which Jonnesco so cautiously adheres, analgesia of cranial nerves can be secured by upper dorsal rachistovainization contradicts, we believe, the results of the experiments of Hill and others, in which fluids injected into the spinal canal did not

reach beyond the foramen magnum. Corresponding to the phenomena of lumbar spinal injections upper dorsal rachistovainization, Jonnesco relates, is usually promptly followed by paresis of the muscles of the head, neck, and limbs. *By what mechanism, under these circumstances, respiration continues, Jonnesco's last article vouchsafed no explanation.*

Jonnesco's reported statistics are: 603 lumbar analgesias with stovaine alone; 412 rachistovainizations by his new method; and 211 spinal analgesias by two pupils, Jiano and Nasta, employing his technics—all without death or serious complication. On the basis of this experience Jonnesco confidently asserts that, by the addition of neutral strychnine sulphate to the anesthetic solution, "superior spinal analgesia can be performed without danger," that "there are no contraindications for general spinal anesthesia, ... it may be employed with any patient," and that "general spinal anesthesia is absolutely safe"; and he is "firmly convinced that general spinal analgesia will be the analgesic method of the future."

Jonnesco's earlier method, including the mediocervical injection, was denounced by Bier and Rehn. His revised method, as recently demonstrated by him, failed in London and has failed thus far in America to arouse an enthusiasm akin to his own. At a recent demonstration in New York the Roumanian surgeon, injected four patients. Two cases were of dorso-lumbar injection and in both the result was quite satisfactory. In the other two—both slender and apparently favorable subjects,—Jonnesco essayed his high dorsal injection. In the first of these he had to insert his needle twice and manipulate it considerably (with the escape of blood) before he withdrew cerebrospinal fluid and inserted the solution. At the visitor's signal the operation was begun. Although it involved only superficial tissues on the chest, the patient complained repeatedly of pain and cried out for chloroform.

Jonnesco (who, it must be said, does not understand English) explained these complaints as due to nervousness and to the sensations of contact and traction—although both during and after the operation the patient plainly felt pin pricks on his arms, and noticed numbness only on one shoulder. In the other case, Jonnesco made repeated punctures with the needle, each time withdrawing blood, and thrust the instrument in and out to such uncertain depths that it appeared to bystanders that the cord must have been more than once punctured, if not actually transfixed. Finally, unable to locate the subarachnoid space by the escape of cerebrospinal fluid, he abandoned the attempt and the patient was etherized. It would be manifestly unfair to condemn the upper spinal injection on the basis of two such failures. But they are enough to warrant the conclusion that this procedure is difficult and uncertain—and Jonnesco's statistics of 117 cases of his own, 39 of his assistants, are not large enough to show that it is not also dangerous.

Concerning the value of Jonnesco's contributions to spinal anesthesia we must preserve an open mind and await the experiences with his methods of other surgeons in other lands. The peoples of different countries are not alike in their susceptibility to, and their capacity to endure, pain; and evidently observers differ in their interpretation of the expressions of physical distress. Nor are 1,000 cases of spinal analgesia enough to form a basis of comparison, as to mortality, with chloroform or ether. Until we have had the verdict of others on the efficacy and safety of the high spinal injection, and a much larger total of strychnine-anesthetic injections, the profession cannot be expected to abandon the view that spinal anesthesia is a valuable resort for cases in which anesthesia by inhalation is contraindicated and local anesthesia is inadequate, but that the wisdom of adopting it as à routine substitute for narcosis has not been established.—W. M. B.

FERD. C. VALENTINE.

Dr. Ferd. C. Valentine, of New York, died on December 13th, in his fifty-eighth year. An earnest worker in the field of genito-urinary diseases, he was best known in the special sphere of andralogy. He was a man of sincerity and liberality, an able public speaker and a writer of marked ability.—E. R.

INTERNATIONAL CONGRESS ON HYGIENE AND DEMOGRAPHY.

On the invitation of the Department of State of the United States Government, the XV International Congress on Hygiene and Demography will convene for the first time on the American continent in Washington, D. C., from September 26th to October 1st, 1910. Section III of this Congress deals with the subjects of the Hygiene of Infancy and Childhood: School Hygiene. It is believed that this will be a meeting of the utmost importance.

Our readers are requested to inform the president of the Section, Dr. A. Jacobi, or the secretary, Dr. Luther H. Gulick, of any pieces of original work which are being done, bearing upon this topic.

Surgical Suggestions.

Much information concerning the nature of an injury to the elbow can be derived by comparison of the joints on both sides posteriorly, the patient facing away from the examiner.

The presence of shreds in the urine is a presumptive evidence more useful to the surgeon who seeks the etiology of a monarticular inflammation than is the denial by the patient that he has had gonorrhea.

If there is reason to believe that one is dealing with a subacromial bursitis, the presence of great tenderness on pressure over the humerus in the axilla should not be interpreted to gainsay the diagnosis—although such tenderness has not been described.

If one fails to quiet a frightened, crying child sufficiently to determine the presence of a tender area, necessary to diagnosis, the administration of chloroform to the point of *primary* anesthesia will make the examination easy and, at this stage of narcosis, pressure on a tender spot will be answered by reflex movements.

Book Reviews.

Aseptic Surgery. By CHARLES BARRETT LOCKWOOD, F.R.C.S., Surgeon to St. Bartholomew's Hospital. *Third Edition.* Duodecimo; 275 pages. London: OXFORD UNIVERSITY PRESS, 1909.

A commendable table of contents gives great promise and an excellent index suggests sufficient performance, but the book itself is written with outcrops of vagueness. The basic principle of aseptic surgery is the abolition of antiseptics and the institution of rigid asepsis. From the practical surgical side the author is thoroughly conversant with his subject. From the bacteriological side there is much to be desired. To describe agar-agar as a "finer kind of gelatine" is scarcely accurate. It is hardly olfactorily definite to state that "staphylococcus aureus has an odor of pus when growing upon culture media." Dermatologists would be greatly surprised to learn that staphylococcus epidermidis albus is the cause "of that excess of scar tissue called keloid." A vivid imagination is required to accept the statement that B. septicus may be seen moving with speed in the liquid resulting from its growth upon gelatin.

Blood culture receives scant attention, probably because the author had only negative results. No technic is described, and his negative results were due to his method of using a few drops of blood gotten by pricking a finger or ear after thorough disinfection.

To advise covering the windows and ventilating openings of an operating room with gauze is hardly reassuring as a satisfactory method of keeping out B. coli communis. The mere fact of the coagulation of milk is an insufficient diagnostic differentiation of B. coli communis from B. typhosus. While the presence of B. typhosus in post typhoidal abscesses is mentioned, there is no reference to the persistence of the B. typhosus in the gall-bladder.

In considering the sources of bacterial infection our ideas of sterilization are shocked. The author's statement that he has never known an instance in which boiling for five minutes has failed to disinfect ordinary tap water is not in line with general experience with American tap water. It is misleading and indefinite to say that "water becomes sterile when mixed with small quantities of chemicals." As an important and too frequently overlooked point, it is properly noted that "bacteria in infective material in the teeth of forceps or in their joints cannot be killed by chemicals," though the statement is too broad to escape criticism. Due consideration is given to the action of heat, corrosive sublimate, carbolic acid, and iodoform as disinfectants. The author prefers to use biniodide of mercury, because in his estimation it does not seem to combine with albumen, causes no precipitation when mixed with blood, nor any opaqueness with coagulated albumen. He states that a 1 to 4,000 solution has no harmful effect upon the body tissues. For instruments he advises a 1 to 40 solution of carbolic acid. No reference is made to the dangers of carbolic acid as a wet dressing.

Iodoform is discussed as an excellent example of the dry antiseptics. While warning of the danger from poisoning by iodoform, there is a total omission of all reference to the dermatologic manifestations of iodoform poisoning. It is exceedingly startling to read the broad comment that "its antagonism to ptomaines renders it of especial value."

In the chapters dealing with the preparation of the "operating theater," the surgeon, patient, instruments, there are many pointed suggestions of undoubted value. These chapters are freer from inaccuracies than the chapters on bacteriology and sources of infection, and in them lies the particular value of the volume.

The last chapter, dealing with the results of aseptic surgery, is especially valuable to students and young surgeons who are accustomed only to modern surgery and its low mortality rate.

The author has made an excellent plea for aseptic as opposed to antiseptic surgery, with its "slavish use of chemicals." As this is the mission of the book, its success, as indicated by fresh editions, is merited.

Lehrbuch der speziellen pathologischen Anatomie für Studierende und Aerzte. Von DR. EDUARD KAUFMANN, Ord. Professor der Allgemeinen Pathologie u. Pathologischen Anatomie; Direktor des Pathologischen Instituts der Universität Göttingen. *Fifth Edition,* revised and increased. Large octavo; 1,383 pages; 686 illustrations. Berlin: GEORG REIMER. Price unbound, 23 M.; bound, 25 M.

The great and increasing demand for this standard work has necessitated another new edition within two years. Although during this short period no striking additions to our knowledge have been made, the author, with exceptional diligence, has revised each chapter and incorporated many new references in the text.

Kaufmann's Pathology excels because of its short, precise exposition; because the importance of clinical observations as a check upon purely pathological anatomy, and vice versa, are always kept in mind and accentuated, and because the material is beautifully, though not too rigidly, systematized.

The classification usually adopted in books on pathology is adhered to. The organs of circulation, blood and lymph, the blood forming organs, the respiratory organs, digestive system, the bones and joints, suprarenal glands, urinary organs, the genital system, nervous system, muscles, synovial sheaths and bursæ, and the skin, are the main headings. Under each of these main divisions the individual malformations, diseases, tumors, etc., are discussed. A short introductory paragraph summarizes the normal anatomy and histology of each organ. By means of capitals, heavy, large and small print, the rela-

tive importance of a fact is clearly shown at a glance.

If any one division of the book is to be selected for commmendation, it is, in our opinion, the one dealing with the osseous system. In this chapter the introductory remarks: "What processes transpire during bone absorption?" and "What processes transpire during the pathological formation of new bone?" are characteristic of the clearness and charm of the entire volume. The direct applications of pathology to clinical medicine are well shown by sections dealing with, for instance, "the lymph-nodes most often the seat of tuberculosis," "where do the first tubercular foci develop in the lung?" "pathological changes following tracheotomy and intubation," "origin and varieties of edema," "under what conditions does diphtheritic inflammation of the intestine occur," etc., etc.

In spite of the enormous amount of material to be handled within comparatively short compass, new theories, if worthy of serious consideration, are clearly stated (as, for instance, the work of Hitschman and Adler upon endometritis); moot points in pathology are considered (the varying opinions about chorioepithelioma in teratomata, the value of vaccine bodies, etc.), and both sides of such open questions are placed before the reader.

The illustrations, most of which are drawn by the author, are simple, clear and yet not diagrammatic. It would be well in subsequent editions to increase the illustrations dealing with tumors of the breast.

No better guide to the literature of the subject can be found than Kaufmann's work. The references are very numerous, and their value is enhanced by the admirable arrangement by which they are collected at the end of the volume, classified under both the subject and the page number.

All in all, no better exposition of the entire subject of pathology can be found. The book has qualities rarely combined—it is readable in style, an epitome in terseness, an encyclopedia in completeness.

Surgical Diagnosis. By DANIEL N. EISENDRATH, A.B., M.D., Professor of Surgery in the Medical Department of the University of Illinois, etc., etc. *Second Edition,* Revised and Enlarged. Octavo; 885 pages; 574 illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1909. Price, $6.50.

This book, excellent for students of medicine, has been submitted to a very excellent revision. Many of the defects of the first edition have been eradicated and many of the sections have been amplified and brought thoroughly up to date, thus placing in our hands a work that, of its type, leaves very little to be desired. The simple, lucid style of the first edition remains unchanged. We note, with great pleasure, the thorough treatment of the section dealing with acute abdominal disease. Throughout the work we find a sincere effort to make it contain the most recent contributions of importance—witness an extract from Codman's studies of subacromial bursitis (p. 647) published toward the end of 1908. There is still room for amplification of three parts of the Surgical Diagnosis: those dealing with Peritonitis, with Diseases of the Breast, with Tumors of the Kidney. The illustrations that have been added are of the same high grade as those of the first edition.

A Text-Book of Obstetrics. By BARTON COOKE HIRST, M.D., Professor of Obstetrics at the University of Pennsylvania; Gynecologist to the Howard, the Orthopedic and the Philadelphia Hospitals, etc. Octavo; 992 pages; 847 illustrations, 43 of them in colors. *Sixth Edition,* revised and enlarged. Philadelphia and London: W. B. SAUNDERS Co., 1909. Cloth, $5; half morocco, $6.50.

This popular text-book has now seen six editions and four reprintings since 1898. The present edition deals not only with obstetrics, but also with "the complications and consequences of the child-bearing process at all periods, that is to say, all gynecological operations." When the author says that "pan-hysterectomy for chorioepithelioma is as much an obstetric operation as the application of forceps," and that "it is illogic to recommend the operative treatment for retroversion of the uterus following childbirth * * * and then to tell the student nothing about the kind of operation to select or the technic of its performance," he may be theoretically right, but the enormous amount of detail that must be covered in a modern text-book prevents the execution of such a scheme, or renders it largely abortive. To carry out this practice consistently and successfullly would require "a continued in our next," which would make the three volume English novel of tradition look small and ashamed!

This work is too well known to require detailed review. As a guide to students and to physicians in active practice the combination of a short but practical exposition and references to original sources is to be highly recommended. In this connection it is regrettable that though the older literature is fully cited, many recent articles of merit have not been incorporated in this new edition.

We are surprised that hysterectomy for puerperal sepis is so strongly praised, while ligation of the veins for thrombophlebitis is dismissed in three lines. Both of these operative procedures are still so much *sub judice,* that the student should be made aware of both methods, but warned and encouraged to take a conservative standpoint until certainty replaces our present lack of knowledge in the difficult field of puerperal sepis, metrophlebitis and peritonitis. In the rest of the volume the personal views and experiences of the author add greatly to the charm and instructiveness of the whole.

The illustrations are excelent, both those from other sources and those prepared for the book. This applies particularly to the large colored plates.

Medical Gynecology. By SAMUEL WYLLIS BANDLER, M.D., Adjunct Professor of Diseases of Women, New York Post-Graduate Medical School and Hospital; Associate Attending Gynecologist, Beth Israel Hospital, New York City. *Second Edition.* Octavo; 698 pages; illustrated. Philadelphia and London: W. B. SAUNDERS COMPANY, 1909.

The first edition of this book has received favorable comment in our review column. That a second edition has been called for a very short period bespeaks the acceptability of the work. Numerous minor changes have been made, and the description and diagnostic use of head zones has been added.

The book will prove of distinct value to the general practitioner who desires to do so-called "office gynecology." The great drawback to publications of this nature is, however, that while methods of treatment are readily acquired by reading this, or similar treatises, the diagnosis of the conditions which call for the treatment are usually to be gained only by extended experience.

The American Illustrated Medical Dictionary. A new and complete dictionary of terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Nursing, and kindred branches. By W. A. NEWMAN DORLAND, A.M., M.D., Assistant Obstetrician to the University of Pennsylvania Hospital, etc. *Fifth Edition.* Octavo; 876 pages; illustrated with many drawings and colored plates; flexible leather cover. Philadelphia and London: W. B. SAUNDERS COMPANY, 1909.

The excellence of this medical dictionary has been sufficiently indicated in reviews of the third and fourth editions. The appearance of a fourth revision within nine years bespeaks the author's commendable, and withal successful, effort to keep his dictionary abreast with the expanding nomenclature and varying terminology of the medical sciences. In this edition over 2,000 new terms have been added, and "the majority of these words appear for the first time in any dictionary." Many definitions have been revised. A new plate has been added showing the regions of the body according to the B. N. A. terminology. Although this edition contains about 40 pages more than the preceding one it is no larger in actual bulk, and the book is therefore still very convenient to handle.

Minor and Operative Surgery, Including Bandaging. By HENRY R. WHARTON, M.D., Surgeon to the Presbyterian Hospital, and the Children's Hospital; Consulting Surgeon to St. Christopher's Hospital, the Bryn Mawr Hospital and Girard College. *Seventh Edition*, revised and enlarged. Duodecimo; 683 pages; 555 illustrations. Philadelphia and New York: LEA AND FEBIGER, 1909.

It is interesting to note the gradual expansion of this popular work from a student's quiz compend into a manual to which practitioners may profitably refer. In this edition much new matter has been added. The section on minor surgery is one of the best among American manuals, and the section on operative surgery describes the operations selected as most important for consideration, clearly and concisely.

Nouveau Traite de Chirurgie. Publié sous la Direction de A. LE DENTU et PIERRE DELBET. Vol. XVI. MALADIES DES MACHOIRES par LOUIS OMBRÉDANNE, Professeur Agrégé à la Faculté de Médecine de Paris; Chirurgien de l'Hôpital Saint-Louis. Octavo; 198 pages; 102 illustrations. Paris: J.-B. BAILLIÈE ET FILS, 1909.

This volume includes all the older and newer knowledge of diseases of the upper and lower jaw. Of special interest are inflammations, disturbances due to eruption of the wisdom teeth, and the chapter dealing with mixed tumors. Fractures are carefully discussed. The book is fully illustrated.

Clinical Studies for Nurses. A Text-Book for Second and Third-Year Pupil Nurses, and a Hand-Book for All Who are Engaged in Caring for the Sick. By CHARLOTTE A. AIKENS, formerly Superintendent of Columbia Hospital, Pittsburg, and of the Iowa Methodist Hospital, Des Moines, etc., etc. Duodecimo; 510 pages; 178 illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1909.

Miss Aikens, author of several books for nurses, puts this forth as the second volume of a series of which her "Primary Studies for Nurses" was the first. It is a well planned book, gathering together, in condensed form, much information concerning diseases and their treatment, that is scattered through various text-books for nurses or left to instruction by lecture or ward demonstrations.

Bacteriology for Nurses. By ISABEL MCISAAC, Author of "Primary Nursing Technique," "Hygiene for Nurses," etc. Duodecimo; 179 pages; illustrated. New York: THE MACMILLAN COMPANY, 1909. Price, $1.25.

A convenient compend adapted to the needs of the nurse in training.

Books Received.

Die Massage und ihre wissenschaftliche Begründung. Neue und alte Forschungsergebnisse auf dem Gebiete der Massagewirkung. Von SANITÄTSRAT DR. MED. CARL ROSENTHAL, Berlin. Brochure of 144 pages. Berlin: AUGUST HIRSCHWALD, 1909. Price, 3 M. 60 Pf.

Bibliotheque de la Sage-Femme. Manuel de Pratique Obstetricale. Par E. PAQUY, Ancien Chef de Laboratoire; Ancien Chef de Clinique d'Accouchement à la Faculté de Médecine de l'Université de Paris. Duodecimo; 409 pages; 104 illustrations. Paris: FELIX ALCAN, 1910. Price, 4 francs.

Radiation, Light and Illumination. A Series of Engineering Lectures delivered at Union College. By CHARLES PROTEUS STEINMETZ, A.M., Ph.D. Compiled and edited by JOSEPH LE ROY HAYDEN. Octavo; 305 pages; 126 illustrations. New York: MCGRAW HILL BOOK CO., 1909. Cloth, $3, net.

Progress in Surgery.

A Résumé of Recent Literature.

Two Cases of Compression of the Body Followed by Traumatic Asphyxia (*Zwei Fälle von Stauungsblutung nach Rumpfcompression*). E. SCHULTZE, Berlin. *Archiv für Klinische Chirurgie*, Vol. 90, Part 4.

These two cases bring up the total of the reported cases to 42. The patients, women, were standing together between a clothes-press and the wall. The big machine suddenly began to rotate and, catching both the women, it violently compressed them against the wall. The patient nearest the machine died instantaneously; the one nearest the wall recovered. In both there was an extraordinary cyanosis of the face and neck—the color a bluish-red. On the head, neck and upper thorax were numerous fine subcutaneous hemorrhages, in streak-like groups. There were larger hemorrhages in the conjunctivæ. The eye grounds, the ears, the mouth and throat were negative. In neither case was there any external injury or any fracture.

The patient who recovered was violent for several hours and remained unconscious for two days. In a week the hemorrhagic areas all disappeared. The autopsy on the other cases indicated that the thorax was compressed; however, there was no fracture, no rupture of the lungs. There was a thin layer of blood between dura and arachnoid, the cerebral veins and arteries were distended with blood, the sections of the brain showed numerous punctate hemorrhages.

Experiences with Excision and Resection of Gastric Ulcers (*Erfahrungen über Excision und Resection bei Magengeschwüren*). E. PAYR, Greifswald. *Archiv für Klinische Chirurgie*, Vol. 90, Part 4.

Surgeons are agreed that gastroenterostomy is a useless, if not harmful, operation when performed for gastric ulcers that do not narrow the pyloric orifice. In the past few years excision of such ulcers has been practised. For several types of ulcers, however, Payr advocates a more radical procedure—circular resection. He employs this operation for callous ulcers, for ulcers producing perigastritis, for those causing hour-glass stomachs and for those perforating into adjoining viscera. He finds that the immediate and the ultimate results are good, and that the mortality is much lower than that of resection for carcinoma.

Payr selects his cases for resection carefully and determines on the operation only after an exploratory gastrotomy and after mobilizing the posterior aspect of the stomach for purpose of orientation. In general, the advantages of resection over excision are that the diseased tissue in the neighborhood of the ulcer is removed, and with it the altered vessels that may lead to recurrence; the suture line runs in tissues that are healthy and free from adhesions; there is no tension on the sutures and no deformity of the stomach.

Ureterocele (*L'Ureterocèle*). P. CACCHIA, Rome. *Archives Générales de Chirurgie*, Vol. 4, No. 10.

The writer has gathered 22 cases of hernia of the ureter and adds two. In brief they are:

1. An adult male had noticed an inguinal hernia for several months. With the beginning of an application of a truss, urinary symptoms began—pain for as long as one-half hour after micturition. No frequency. The hernia was small and was reduced without any gurgle. At operation, there was a prehernial lipoma which contained a small portion of adherent bladder. External to it was a cord of uniform character, which descended to the bladder—this was evidently the ureter. There was no hernial sac.

2. This patient had had hematuria from time to time. The operation was performed for bilateral scrotal hernia. Adherent to the anterior aspect of the left sac was a cord as in the first case. It was isolated for over two inches and was traced to the bladder.

In both cases the urinary symptoms cleared up after operation.

Cacchia classifies the published cases of hernia of the ureter into ureterocele simple or combined with paraperitoneal cystocele and extraperitoneal cystocele combined with ureterocele. There are certain findings by which the diagnosis of this affection may be made. They are: Incomplete reducibility of a hernia, leaving behind a soft uniform cord that does not resemble gut, or sac, or varicose veins. Absence of gurgle on reduction. Urinary symptoms, indicating blocking of the ureter. The presence of hydronephrosis without other known cause. Findings by cystoscopy and ureteral catheterization. In most of the reported cases, however, the physical examination did not lead to a suspicion of ureterocele.

The Tearing Out of the Rectum in Fractures of the Pelvic Ring (*Die Ausreissung des Mastdarms bei Beckenringfracturen*). P. HARRASS, Hanover. *Deutsche Medizinische Wochenschrift*, No. 43.

To the one reported case of this exceedingly unusual condition the writer adds two. All three cases were fatal —they presented very similar findings. The trauma was a powerful, crushing force applied to the anterior aspect of the pelvis. The patients were in profound collapse. Bleeding from the rectum was in no case profuse. The lower end of the rectum (including the sphincters in two cases) was found torn loose from the surrounding skin and pelvic fascia. The tearing out force had completely isolated a large part (in one case all) of the rectum. The result was a condition analogous to that of amputation of the rectum, just before the bowel is removed. In all the cases there was free bleeding from the torn perirectal structures, in one case there was considerable blood collected in the bowel above the sphincters. The comparative freedom of the rectum itself from serious injury was a remarkable feature.

The fracture present was a comminuted one of the pubic bone, alone or associated with a fracture near the sacro-iliac synchondrosis. The post-mortem examination demonstrated that the other structures lying in the pelvis were, in comparison with the perirectal lesions, only mildly injured.

The mechanism by which this isolated avulsion of the rectum occurs is not definitely established. Kirstein, in his case, believed that the lesion was due to the direct crushing force of the trauma. Harrass inclines to the belief that the condition results from a combination of a tearing out force—the sudden and violent distortion of the fractured pelvic ring—and a crushing one.

A New Operative Treatment for Hypospadias in the Male (*Eine neue Methode zur Operation der männlichen Typospadie*). VON SCHMIEDEN, Berlin. *Archiv für Klinische Chirurgie*, Vol. 90, Part 3.

The author's method, successfully applied in two cases, is as follows: Before the new urethra is built, the shaft of the penis is straightened and lengthened, in those cases in which it is deformed and diminutive, by one of the plastic operations. A section of ureter is obtained from a nephrectomy for hydronephrosis, etc. (in one case the author removed it from a child recently dead because of congenital malformations) and the piece of ureter is washed in a stream of normal salt solution. The loose portions of the adventitia are removed. The shaft of the penis is pierced by a trocar-canula, the point of the instrument making its appearance on the scrotal side of the urethral opening. The trocar is removed and through the canula the section of the ureter, attached to a small probe, is drawn. The canula is removed, the excess of ureter is trimmed off at each end and the ureteral ends are sutured to the skin of the glans and of the inferior aspect of the penis. Only a simple dressing is necessary. After the implanted ureter is fully healed in place, injections of sterile oil are made through its lumen. After four or five weeks, the mouths of the urethra and of the inferior end of the ureter are freed and are united by a circular suture. Perineal drainage of the bladder is advisable.

Ablation of the Thymus (*Ablation du Thymus*). VEAU AND OLIVIER. *Annales de Médicine et Chirurgie Infantiles*, No. 19, 1909.

Two cases are reported (a third case is so far successful, but operated upon too recently to make definite statements). The first was an infant of 13 months, born normally and of healthy parentage. Occasionally she had attacks of coryza, but never presented disturbances of the voice or of respiration. At the age of one month, there was a sudden attack of respiratory stridor associated with cyanosis; when the mother placed the child in the vertical position, the attack passed off. Subsequently there were three similar attacks. In the attack that the authors saw, there was profound inspiratory dyspnea, but no cyanosis; the voice was feeble, but not roughened. Percussion revealed dulness over the manubrium sterni. The pharynx was negative. There were no signs of rickets. During this attack there were occasional crises of suffocation. At operation, two days later, the tissues were incised down to the level of the thymus. The latter completely disappeared during inspiration, to balloon out in expirtion. The capsule was incised and the upper pole grasped. It tore off from the remainder of the gland; no bleeding followed. The part of the thymus that tore loose was the size of a small nut. The immediate operative result was remarkable. The child breathed normally and took its nourishment well. The subsequent course of the case was a perfectly normal one. This patient was operated upon without a definite diagnosis; no cause for the attacks of suffocative dyspnea, other than a possible thymus enlargement, could be found.

The result in the second case was much less encouraging. At the age of two months, stridor first appeared. It became more marked and permanent, being exaggerated during sleep. When 11 months old, the child came under the authors' observation. Inspiration is rough, loud and prolonged; expiration is quiet; there is no cyanosis. When the child cries, the stridor is more marked; in sleep, its intensity is diminished. The results of percussion are questionable. Palpation is negative. At operation, the thymus was exposed through a median incision, its capsule was incised, and the organ was grasped. It pulled out of its capsule with the greatest of ease. The left lobe was delivered, tied off (although no vessels were visible) and removed. A large part of the right lobe was removed in the same way. Weights: left lobe, 2 gr., 70; part of right lobe, 1 gr., 85. The post-operative course was smooth. The functional result was nil.

From theoretical considerations and from the study of these two cases and others in the literature, the writers arrive at these conclusions: A clinical method must be found by which stridor due to enlarged thymus and that of purely laryngeal origin shall be differentiated. Operation should not be performed for stridor alone. Operation should be performed for stridor associated with the physical signs of an enlarged thymus. Operation should be performed when stridor coexists with attacks of asphyxia.

Rupture and Luxation of the Extension Aponeurosis of a Finger (*Rupture und Luxation der Streckaponeurose eines Fingers*). H. SCHLOFFER, Innsbruck. *Archiv für Klinische Chirurgie*, Vol. 90, Part 3.

A locomotive lever struck the dorsal aspect of the patient's little finger, at the first interphalangeal joint. Patient experienced considerable pain and could no longer extend his finger. There was marked swelling and 90° flexion at the first interphalangeal joint. When the first stage of extension was performed for the patient, he could actively complete it.

There was no improvement in function under conservative treatment and three months later an operation was decided upon. Under local anesthesia the incision over the dorsum of the joint was carried down to the altered joint capsule. No tendons were to be seen. The edges of the torn aponeurosis had retracted and were found adherent to the tissues of the palmar aspect of the finger. They were freed and brought together on the dorsal aspect of the joint. It was then found that the patient could fully extend his finger. The edges of the torn aponeu-

rosis were held together by two sutures. With this operation, the function of extension has fully returned to the finger.

Although rupture of the extension aponeurosis of the end phalanx is very common, Schloffer could find but two other cases of its rupture at the mid-phalanx.

Tuberculous Infection of the Peritoneum. W. H. ALLPORT, Chicago. *Surgery, Gynecology and Obstetrics,* November, 1909.

The paper is based upon eight cases and upon the literature. Allport believes that the difference in incidence in the male and female is apparent rather than real, due rather to the inclusion of the female genitals within the abdomen. The different forms, so-called, are due to differences in location and to the recognition of the disease at various stages in its development. Peritoneal tuberculosis is never primary, the most common portal of entry is the bowel, next the lymph glands and next the female genitals. Gravity and diffusion by contact play an important part. Temperature, especially remittent fever, point to mixed infection. High leucocytosis and temperature after operation indicate good resistance. Tuberculosis should be considered if prolonged fever and delayed convalescence follow abdominal operations. Ascitic fluid has no protective influence. The healing occurs after removal of the fluid because of the active hyperemia and the formation of adhesions. The surgical evacuation of the fluid and complete collapse of the cavity assist nature. Simple incision, evacuation and no drainage is the method of choice. Radical operations are emergency measures. Fecal fistulæ, often fatal, result from drainage, especially in the dry form of tuberculosis.

Post-Operative Psychoses. H. A. KELLY, Baltimore. *Surgery, Gynecology and Obstetrics,* November, 1909.

Of the mild, transitory changes following operation Kelly has seen 50 cases in 1,300 patients operated upon in his private hospital; of severe cases he has record of 40 in 16,000 patients. Post-operative psychoses are seen often in childhood and the aged, but occur also in women in the prime of life, most frequently in those of 35 to 45. Anesthesia, physical shock, the kind or severity of the operation, are not effective causative agents. Infection, auto-intoxication, drug intoxication are important factors, but many psychoses are entirely independent of them. Mild aberrations of transitory nature are very common. An unstable nervous system and especially anxiety and worry about the operation are the most potent factors. The prognosis is favorable. Prophylaxis consists in quieting and reassuring the patient; in this connection the nurse is important. Care should be taken to avoid legal or forensic complications by frankly dealing with the family from the onset of the trouble.

A New Method for the Removal of Uterine Cancer (*Ein neues Verfahren zur Extirpation des Uterus-Karzinoms*). E. WERTHEIM. *Zentralblatt für Gynäkologie,* September 18, 1909.

Wertheim shows that he used the method now recommended by Zweifel as early as 1900. The method consists in performing a typical hysterectomy by the abdominal route. After all the vessels are tied and the vaginal tube freed from bladder, rectum and paravaginal tissues, the uterus, ovaries and tubes are pulled downward (by an assistant who drags on the cervix) and the pelvic peritoneum is completely closed over the structure. The abdominal wall is now sutured and the patient placed in the lithotomy position. From below the vaginal walls are now cut across at a sufficient distance from the cervical growth. This procedure completely liberates the internal genital organs which are removed, and the vaginal edges are secured. By this method soiling of the peritoneal cavity should be completely avoided. Wertheim says that he has abandoned this procedure. [Cullen, however, in his work on cancer, endorses the above mode of operating].

Lipoma of the Larynx. M. A. GOLDSTEIN. *The Laryngoscope,* September, 1909.

Goldstein reports a very interesting case of lipoma of the larynx. It occurred in a woman, thirty-three years of age, who showed evidences of extreme physical depression, sallow complexion, moist and clammy skin, shallow, labored, irregular respiration, etc. Laryngeal examination showed a large, rounded, pale, yellowish-pink mass, completely filling the glottis, extending from the left lateral wall of the ventricular fossa, pushing the ventricular band upward and overlying both vocal cords.

The development seems to have been a gradual one; the tone of the voice was peculiar, and has been gradually changing in character and in volume. There was never complete aphonia, but hoarseness occurred in later years. There was pain and discomfort only when colds were contracted; breathing had become more labored in the past few years and especially aggravated during over-exertion, or nervous irritation.

The growth was removed endolaryngeally by the indirect method with a snare. Inspection of the larynx after the healing of the wound showed the left ventricle of Morgaghi free, and the left ventriclular band restored to its normal plane and position. The vocal cords approximated perfectly and the voice lost the peculiar muffled character which had been noticed for many months. Report of the tumor, microscopically examined by Dr. Wright, was lipoma.

The author goes into the etiology of the condition very thoroughly and gives the reports of twelve cases by other authors.

Pemphigus of the Throat—Report of a Case. LEE MAIDMENT HURD. *The Laryngoscope,* September, 1909.

Hurd reports a case in a woman, 33 years of age. About five years ago, she began to notice at irregular intervals, a sore throat, with loss of appetite, and with some attacks, she had marked dysphagia. One year ago, a similar condition developed on the conjunctiva of the left eye. Syphilis was first thought of. There presented on the posterior pharyngeal wall a superficial ulceration covered with a white exudate. Two days later, bullæ were discovered on the velum. There was also a small bulla at the base of the tongue. There was never any evidence of eruption on the skin. During the following year the condition of the eyes became so much worse that she lost her sight. The condition in the throat did not seem to change. Pemphigus limited entirely to the mucous membranes is a very rare condition.

The Treatment of Hydrocephalus by Puncture of the Corpus Callosum (*Die Behandlung des Hydrocephalus durch den Balkenstich*). VON BRAMANN, Halle. *Deutsche Medizinische Wochenschrift,* No. 38.

Anton of Halle first suggested that if a wide communication be made between the lateral ventricle and the subdural space it would be lasting. Accordingly von Bramann developed the following technic: In children the approach is through the anterior fontalille; when cranial ossification is complete, a small button of bone is removed just to one side of the median line. After the dura is incised, the cerebral hemisphere is gently retracted from the median line, all retaining vessels being ligated. Avoiding the longitudinal sinus, a canula of 2 mm. bore is passed along the falx cerebri until the corpus callosum is reached. The canula is plunged through the corpus callosum and fluid from the distended fourth ventricle escapes through and beside the canula. The latter is then swept backwards and forwards to make a generous opening and is removed. The dura and scalp are sutured.

This method was practised by von Bramann in 22 cases, eight of which were hydrocephalus. Three of these cases were in hopeless condition, with such complications as infected myelocystocele, infected spina bifida, etc. Two recent cases, of the remaining five, have improved, but are of too recent a date to afford definite statements. A child aged 2½ years, whose cranial circumference measured 59

cm., who spoke a few blurred words, cried constantly and had adductor spasm of the extremities showed marked improvement 10 weeks after operation—the crying had ceased, the child could stand, could utter sentences, the adductor spasm was gone. The second case was that of a boy, aged seven, who had had a progressive hydrocephalus with ataxia, choked disc, inability to walk, etc. One month after operation, the choked disc, headache, etc., had disappeared. The third case was a bedridden child of five who could speak only primitive words, was profoundly apathetic, etc. One year after operation there is marked psychic improvement and the child can sit and control the movements of his limbs.

Suprapubic Operation Upon the Pelvic Floor for Prolapse of the Uterus. W. M. POLK, New York. *American Journal of Obstetrics*, September, 1909.

In extreme cases of prolapse Polk performs a laparotomy and then make a vertical incision through the peritoneum where bladder and uterus join anteriorly, shoving the bladder forward and laterally in order to expose the vagina as far as the trigone. He now takes a running suture of kangaroo tendon, which starts as far down as possible, and is passed deeply so as to approximate the antero-lateral parts of the vagina in the median line (reefing lax structures). Superficial to this first layer a second is taken, approximating fascial and peritoneum. The sacrouterine ligaments are then shortened. The uterus may be preserved and retained in marked anteversion or may be removed at the level of the internal os, in which cases the stump should be sewed into the remains of the cervix.

The Surgical Anatomy of Inguinal Ectopia of the Testicle. LAURENT DE RAYMOND, Montpelier, France. *The American Journal of Urology*, September, 1909.

An exhaustive study of this subject is not attempted by the author; he analyzes the material he has seen and finds three different conditions that retain the testicle in the inguinal canal. 1. The resistance offered by the vas deferens due to its congenital shortness. This condition is very rarely seen. More often the testicle itself is held either by thick muscular bands developed from the cremaster or by fibrous bands springing from the same muscle. The latter may be exceedingly strong and bind down both vas and testicle. 2. The resistance offered by the vascular pedicle which may form a rigid and inelastic cord. This condition is more commonly seen than the first and is readily handled at operation. 3. The most frequent and most important resistance offered to attempts to bring the testicle into the scrotum is that offered by the vaginoperitoneal sac. In some cases it is found open; in others, closed partially or completely. In either case it adheres to the sides of the vas deferens and to the vascular elements of the cord; it becomes folded and creased in this position and, adherent as it is, it forms a true plaiting. At operation, the separation of this vagino-peritoneal sac must be absolutely complete and must extend from the internal abdominal ring to the upper pole of the testicle. This separation may be easy or may be accompanied by numerous complications. De Raymond illustrates these groups of conditions by interesting cases.

The Operative Reduction of Old Dislocations of the Elbow-Joint (*Die operative Einrenkung veralteter Ellenbogenverrenkungen*). J. DOLLINGER, Budapest. *Deusche Zeitschrift für Chirurgie*, Vol. 100.

The functional end-results after operative reduction in these cases are decidedly better than those of resection, according to Dollinger's experience. Resection is indicated only in those cases in which such deformities of the articular surfaces have developed as will not permit normal movements after reduction. In none of the 34 cases of dislocation of more than three weeks' standing could bloodless reduction be performed. In the beginning Dollinger avoided cutting the lateral ligaments in his operative procedures, but later found that their division was often essential to proper reduction. Of 13 cases of operative reduction that could be followed, 11 have excellent functional results. Of 11 cases of resection, 6 have stiff joints and the remaining 5 have mobility from 50° to 85°.

The Treatment of Severe Bullet Wounds of the Lung by Suture (*Zur Behandlung schwerer Schussverletzungen der Lunge mit Naht*). M. GRASMAN, Munich. *Münchener Medizinische Wochenschrift*, October 12, 1909.

Garrè's statistics, comprising 700 shot, puncture or rupture wounds of the lung, show a mortality of over 40 per cent. by conservative treatment. The reason for this extreme conservatism has been the poor condition of patients when first seen, the exaggerated fear of complete pneumothorax (operative), and the, at times, complete recovery of seemingly desperate cases. The early dangers are internal hemorrhage and asphyxia from pressure—pneumothorax, and the later danger of infection and sepsis. The practice has existed of only at a late stage relieving the pneumo- or hemo-thorax by puncture. When infection takes place extensive thoracoplastics have been required. In either case convalescence is protracted, intercurrent dangers are great, and permanent damage to the thoracic organs remain.

The operation immediately after an injury is short in duration and can, if necessary, be done under local anesthesia. Simple pneumothorax will rarely require interference. Injury to a bronchus, which is followed by pressure pneumothorax (displacement of mediastinum and kinking of the great vessels) demands operation. If uncomplicated, permanent drainage with a valve cannula may suffice.

At operation the thorax should be widely opened, the lung wound found and sutured, all blood within the pleura removed and expansion of the lung favored by fixation in the wound or by means of the positive or negative pressure apparatus.

The author favors chloroform narcosis. One or more ribs are resected or a movable flap made. The lung is at once pulled out of the wound; this serves to fix the mediastinum. Both entry and exit wounds are sought for, the edges cleaned or excised, tissues approximated with one or two tension sutures, and a superficial pleural suture inserted (visceral pleura). Silk should be used. Broad surface wounds are fixed in the thoracic wound. The pleura is carefully cleansed, the lung expanded as explained before, and the costal wound completely closed *without drainage*.

The reported cases of operative interference is now 18. Of 9 bullet wounds 6 recovered; of 6 puncture wounds, 5 recovered; of 3 ruptures, 2 recovered. Twenty-five additional cases of puncture wounds have been reported, with 9 fatalities.

The author reports two cases of revolver wounds of the lung upon which he operated by the technic indicated. Both recovered, convalescence proving smooth. One of his cases had an injury of the pericardium in addition to the lung injury.

The Use of Silver Wire in Opening the Kidney. Preliminary Report. E. K. CULLEN and H. F. DERGE, Baltimore, *Johns Hopkins Medical Bulletin*, November, 1909.

Based upon the fact that the blood supply of the kidney may be likened to the branchings of a tree, the authors conceived the possibility of opening the kidney from within outwards with some blunt cutting edge which would avoid or push aside the larger and more resistant bloodvessels, and thereby bring about a minimal amount of hemorrhage. With this end in view, the authors performed a series of nephrotomies in animals in which the cutting edge employed was No. iii or iv silver wire. The wire was threaded in large liver needles, which were passed in longitudinal or transverse directions through or near the pelvis; with gentle sawing motion the wire was gradually brought to the surface. The authors advise that the capsule of the kidney be divided by the knife in the direction where the wire is to come out in order to avoid troublesome bleeding from the tearing of the capsule. They also emphasize

the necessity of exerting firm counter traction as the wire is being brought to the surface, in order to prevent possible tearing of the renal vessels. The authors found that with this method, a clean cut surface was obtained and that the resulting hemorrhage was from one-eighth to one-fourth that obtained when the knife was used. In fact, the bleeding was so small that it practically ceased when the cut surfaces were apposed, and only superficial sutures are necessary in order to close the nephrotomy. Thus far, this method of opening the kidney has been employed in four patients and proved satisfactory in each case.

Rupture of the Biceps Brachii (*Zur Frage der Ruptur des Biceps Brachii*). G. LEDDERHOSE, Strassburg. *Deutsche Zeitschrift für Chirurgie*, Vol. 101, Parts 1 and 2.

In a long experience, frequently supported by operative findings, in so-called rupture of the biceps muscle, the author is in complete variance with the generally accepted ideas of the condition. First, the dislocation of the external belly of the biceps, generally attributed to rupture of the muscle, is due, in most cases under Ledderhose's observation, to a disease of the long biceps tendon or to its transposition, in cases of arthritis deformans of the shoulder joint. Trauma is the determining factor. The writer questions the existence of any cases of spontaneous rupture of healthy muscle or tendon. Of course, there are numerous cases on record of rupture of the biceps by direct trauma; to these Ledderhose does not refer. The cases of so-called hernia of the biceps are, according to Ledderhose, almost invariably dislocations of the external belly of the muscle.

The After Results of Operative Treatment of Hemorrhoids. A Study of 300 Cases. H. GRAEME ANDERSON, London, *British Medical Journal*, October 30, 1908.

Of the 300 cases, 150 were operated by the ligature method, 100 by the Whitehead operation, and 50 by the clamp and cautery. He found that with the clamp and cautery, the pain was less severe; the necessity for catheterization never arose; return of sphinteric control occurred earlier; contraction of the anal canal never occurred; such complications as abscess, fistula and ulceration never arose, and the duration of recovery was shorter.

An Improved Method of Removing the Testicle and Spermatic Cord for Malignant Disease. J. BLAND-SUTTON, London, *Lancet*, November 13, 1909.

Bland-Sutton makes a strong plea for a radical method of operation for malignant tumors of the testis, comparable to those that are performed for malignant growths in other parts of the body. He says that the surgeon should not be merely satisfied in remaking the primary growth; such operations are nearly always futile for the reason that the patient ultimately succumbs to an intra-abdominal lymphatic infection. The operation which the author has devised and which he practiced upon one patient is as follows: After dissection of the affected testis and spermatic cord up to the internal abdominal ring, an incision is made in the semilunar line from the costal arch to the internal ring down to the peritoneum. The peritoneum is pushed aside until the entire lumbar region is exposed; all the enlarged lymphatic glands around the aorta and vena cava are then removed. The spermatic vessels are ligated as high up as possible and the vas deferens is ligated at the pelvic brim; the entire mass is then removed. In the author's case, a gland was found over the vena cava which on section revealed metastatic growth.

A Comparative Study of Serum Diagnosis in Syphilis. HOMER F. SWIFT, New York, *Archives of Internal Medicine*, October 15, 1909.

Swift arrives at the following conclusions:

1. The Wasserman reaction is a fairly definite diagnostic measure. A positive reaction practically always means syphilis. Negative findings give only presumptive evidence of the absence of syphilis.

2. The Bauer modification is not reliable because of the inconstant content of native hemolysin to sheep cells. A large anti-sheep hemolytic content will mask a partial complement fixation.

3. The Noguchi reaction is more readily applied and the materials are more easily procured and kept than the Wasserman method. It is also more sensitive reaction. This increased sensitiveness, however, sometimes causes a positive reaction with non-specific sera which give a negative Wasserman reaction. Experiments now under way seem to indicate that this may be avoided by the use of inactive serum.

Analgetic Effect of Local Applications of Magnesium Sulphate and Other Salts. SOLOMON SOLIS COHEN, Philadelphia, *Journal American Medical Association*, December 4, 1909.

Cohen has noticed that the external applications of magnesium sulphate solution relieved certain deep-seated pains of arthritis, cutaneous inflammation, etc., he would not say in consequence of but sequent to the application. In order to test whether or not this was a psychic phenomenon, other applications were made—simple, saline solution, distilled water, magnesium chlorid, sodium sulphate, etc. While any moist dressing alleviated the pain somewhat, none of them had the decided effect of magnesium sulphate. To determine whether or not any local anesthesia was produced, the tactile sense, pain sense and thermal sense, were tested in normal persons, in the patients relieved by magnesium sulphate, and in the patients not relieved by it. In no instance was any effect of any kind on the cutaneous sensations detected, whether the examinations were made within ten minutes or after from thirty minutes to an hour. He represents this merely as a curiosity of observation but thinks it may be useful at times when one does not care to give morphin for deep-seated pains. The problem is complicated and the method of observation is inexact so that he cannot say that there really was a positive action of magnesium sulphate in these cases. He deems the matter, however, worthy of further observation.

A Case of Carcinoma or Diverticulitis of the Sigmoid. H. Z. GIFFIN and L. B. WILSON, Rochester, Minn., *American Journal of Medical Science*, November, 1909.

The patient, a man 68 years of age, gave a history of three attacks of pain on the left side of abdomen, the first occurring three years previously. The two last attacks were accompanied by a chill. Occasional chills occurred in the latter weeks of the patient's illness. During the past month there was loss of blood in the stools, but there was little loss of weight. A mass could be palpated about the size of an orange. At operation, a carcinoma at the junction of the descending colon and sigmoid was found and a number of diverticula without carcinomatous change. Also an abscess in the left iliac fossa with extensive adhesions. The entire descending and iliac portion of the sigmoid were removed. On pathological examination the carcinoma was found to apparently arise in one of the diverticula; two other diverticula were also found lying within the carcinoma, while a fourth lay in the unaffected portion of the sigmoid. Wilson is of the opinion that many sigmoid carcinomata arise from diverticula; it is difficult to determine this origin in many cases, for the reason that so much destruction has already taken place.

A New Diagnostic Skin Reaction in the Acute Infections. LEONARD K. HIRSHBERG, Baltimore. *New York Medical Journal*, September 18, 1909.

With this method, the author claims that he has been able to determine the variety of the infecting organism. The method briefly is the folowing: A number of parallel scarifications are made upon the skin and about 0.1 c.c. of stock vaccines of various germs are applied. The types of organisms used depend upon the suspected infection. Thus in one case, the colon, paratyphoid, streptococcus and gonococcus vaccines were used; in another, the pyocyaneus bac. bulgaricus typhoid, colon and paratyphoid. If the patient is the subject of an infection by one of the organisms, the corresponding vaccination will show local changes, varying from a hyperemia to edema and infiltration of the skin. In 22 cases in which this method was employed, the reaction appeared to agree with the clinical diagnosis. No more exact confirmation seems to have been made by the author.